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Modern Cars Again Prove Their Worth

THE substitution of modern light-weight cars for older and heavier rolling stock on interurban lines of the York Railways and the Johnstown Traction Company in Pennsylvania is told of elsewhere in this issue. Not enough time has yet elapsed since the new cars were put in service to permit an exact calculation of the resultant savings in energy, maintenance, and track costs. But already it is evident that substantial reductions in operating expenses will follow from this modernization of equipment. In addition, the greater popularity of the new cars with the general public is an important consideration.

The experience of these railways is in harmony with that of a number of other interurbans, among which might be mentioned the Kentucky Traction & Terminal Company, the New Haven & Shore Line, and the Aurora, Elgin & Fox River Electric Company. In these and many other cases, modernization of equipment has resulted in reduced expenses and increased revenue.

Under the circumstances it is discouraging to observe the tenacity with which some other interurban railways cling to their old, heavy cars. Faced with rising costs as well as serious competition from the private automobile, they make a great mistake in keeping these antiquated vehicles in service.

"The public is used to these cars and prefers them to the modern, light-weight type," is a frequent argument. In reality, of course, the public would much prefer new cars. Something new always appeals to the popular fancy. That is a large factor in the popularity of the motor bus—it is new. The superiority of the modern car in appearance and comfort is so marked that it is sure to be appreciated.

Some interurban railways claim that they cannot afford to modernize their rolling stock. If it will mean reduced costs and increased traffic, however, such railways are the very ones that can least afford to neglect modernization—and such improvements can be financed.

Specialized Training Required for Publicity Work

A GOOD many laymen think that they understand thoroughly all the problems of the transportation business. In fact, some of them appear to believe they know more about it than do the men who have made it their life work. Yet experience has shown that very often the theories of the butcher, the baker and the candlestick maker fail when put to the test of actual performance.

Railway men are quite familiar with the fact that difficult problems require trained men to handle them. Probably in no other industry has there been a more pronounced tendency and need to utilize the services of specialists in their various lines. This necessity is hardly less compelling in railway publicity work than it is in the engineering department. The successful publicity man must be a specialist in human nature, and must understand the psychology of "the man on the street."

Often a slight change in the wording of a sentence will altogether change the impression it creates. A good example of this is furnished by a suggestion coming from Major J. S. S. Richardson, chairman of the Pennsylvania Public Service Information Committee. He urges that the phrase "educating the public" be avoided and in its place the phrase "informing the public" be used. The general public believes that it is already sufficiently educated, and does not want any more education handed out by the railway. The word "informing," however, causes no such unpleasant reaction.

While it might never occur to a railway executive whose mind is filled with operating problems, this suggestion is so reasonable that it is necessary only to hear it to realize that it is good. Coming, as it does, from an experienced publicity man, it serves to emphasize the value of having a specialist handle the work of that department.

Maintenance Shop Practices Will Bear Close Study

IN THE issue of last week was published an article describing some of the many dies and jigs developed by the Chicago Surface Lines to reduce the cost of frequently repeated operations in the shop. This is an excellent example of what can be accomplished by consistent development of such tools.

On many electric railways, along with the tendency to provide insufficient machine equipment, there is also an inclination to overlook the possibilities of applying modern production methods to maintenance work. In some cases special tools enable existing machine equipment to be utilized for a much wider range of work. A good example of this is the ingenious device described in the Chicago article, by means of which an ordinary punch press is made suitable for punching holes from center punch marks in light structural members.

Railway shop machines and tools should, however, not be diverted from the maintenance functions for which they were intended, to the manufacture of parts and equipment that can be purchased more economically from manufacturers specializing in the production of such parts. In most cases this practice of manufacturing parts in the shop is uneconomical. It frequently may appear that some saving is being made due to the

use of machines which are already available, but manufacturing operations in the shop are likely to tie up these machines when they are needed for maintenance work. In addition, there is a decided tendency among electric railways to hold down the shop supervisory staff to a minimum. In general, therefore, the entire attention and available time of such men is hardly sufficient for the proper supervision and improvement of purely maintenance methods and practices. When their attention is diverted into purely manufacturing operations, maintenance is bound to suffer. Under such conditions, any small apparent saving in the cost of new parts is more than offset.

When repair parts for apparatus that has been discontinued by the manufacturer are required, the practice of making them in the shop sometimes is justified. Under these conditions the parts are usually used in such small quantities that the cost of having them made up special by the manufacturer who no longer carries these parts in stock is too high. As pointed out in the Chicago article, time of delivery also becomes an important factor in determing the procedure to be followed.

This phase of the subject will bear much more thorough study and analysis than it has been given in the past. There is an excellent prospect of reducing in a substantial degree the amount of such special manufacturing work done in the shop. This can be done by a consistently maintained practice of standardizing the many miscellaneous parts and fittings used on cars.

Desirable results can be obtained both in the purchase of new equipment and in the substitution of general standards for many different parts already on the cars, as they come through for repairs. In many cases there is abundant opportunity to eliminate many slight differences in sizes and types, which tend to result in small quantity purchase orders, delays in delivery, and high prices. Thus in many instances where parts are being manufactured in the shop because of high purchase prices, careful grouping and weeding out of obsolete types would result in a much reduced stock list and would allow the size of individual orders to be increased to a point that would command attractive prices.

Train Up a Child in the Way He Should Go

HABIT is stronger than nature, according to an old proverb, and it is a tremendous undertaking to try to change the habits of a nation. Yet this must be done if reasonable individual safety on the streets of our large cities is to be had. Automobiles have completely changed the conditions under which these streets can be used without injury to life and limb. With slow-moving horse traffic there was no call for drivers to be licensed, and there was no great risk when pedestrians crossed the street between corners. With swiftly moving motor vehicles in crowded streets, the need for both careful licensing of drivers and control of pedestrian movement is evident.

Naturally the question of the best way of educating the public to the modern needs of safety in the streets occupied a prominent place in the conference on street and highway safety, held in Washington the first part of last week. The greater part of the report of the committee on education was devoted to methods for teaching the rising generation what should be done. Some suggestions are given as to the ways for reaching adults, and newspapers, posters, movies and the radio are mentioned. But evidently, as pedestrians, adults are expected to know what to do or else to be beyond salvation. It is hard to convince a man who for many years got on and off moving street cars that the closed platform is a good thing, or that it is unsafe to thread his way between crossings through a maze of moving automobiles. But the case is more hopeful with children, to whom a horse is almost a relic of a past age. Proper stress is laid in the report on interesting youth in safety by active participation in it, as through schoolboy patrols and junior safety councils, just as physics and chemistry are taught by laboratory methods. With the children taught there is hope for the elders through precept and example, because in many cases it is very true that the child is father to the man.

Protecting Transportation for the Sake of the Public

SOMEHOW transportation service lies closer to the heart of the average man than does the service rendered him by any other utility. He is more jealous of his rights as a patron of the trolley company than he is of his rights as a customer of the electric company. For this reason, where railway rates or service are concerned, he is particularly critical of the work of the public service commission. Nevertheless, rising costs of labor and material, as well as the increasing competition of the private automobile and the bus and truck, have made the problem of maintaining the financial stability of the necessary transportation systems a grave one. Commonly, therefore, the public service commission is indeed between the devil and the deep sea.

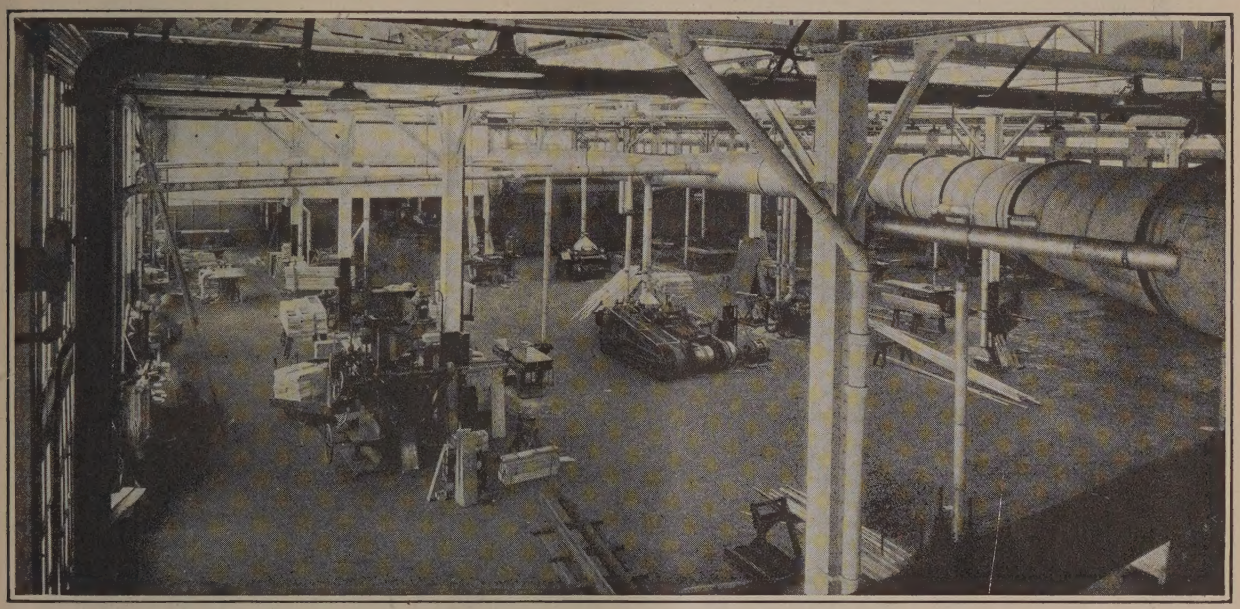
For example, if an application is made by an independent bus operator to run over a route where his service will duplicate that of an existing railway, a regulatory body would ordinarily refuse to grant it. But it is difficult for people to understand why the commission should thus deprive the people of a service which would be a convenience for them. They feel that if some one is willing to provide the service he should be allowed to do so, and they are inclined to regard the refusal of a permit under such circumstances as an act of favoritism to the railway. In order to attain the best results in the end, however, it is necessary often more or less to disregard the immediate effect on the public temper.

To the credit of the commissions it must be said that decisions are made after careful investigation by experienced men. If the outcome is sometimes displeasing to the railway, usually the company is nevertheless willing to admit that it was made in good faith. The public, on the other hand, is too ready to question the motive of the commission. This is no doubt due to a lack of understanding of the considerations upon which the decisions are based. When the people, through longer experience, become more familiar with the methods of regulatory bodies and realize that the latter must protect the transportation systems for the sake of the public as well as for the sake of the stockholders, they will probably come to repose a greater confidence in the wisdom of these decisions. This points to the need for more informative publicity along these lines.

Boston "L" Woodworking Shop Uses Individual Drive

Third Article

A Great Variety of Equipment Is Installed for Car Repair Work in New Everett Shops—Machine Shop Is Temporarily Housed in the Wood Shop—Method of Stripping and Rebuilding a Car Described



Noteworthy Features of the Wood Mill Are the Individual Motor Drives for All Tools and the Suction Dust Collecting System

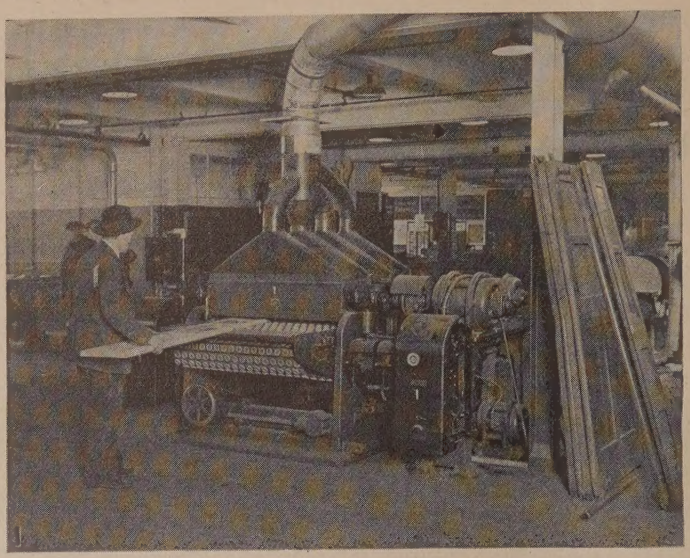
THE section of the new Everett shops of the Boston Elevated Railway now used as a carpenter shop and wood mill presents a good illustration of individual motor drive. Induction motors are used mainly, operating on a three-phase, 60-cycle, 550-volt circuit. The various tools installed also show advanced practice in safety engineering. The accompanying table, which lists the principal motor-driven machines in the shops, indicates that there is a greater variety of machinery than ordinarily has been available for car repair work on electric railways.

The many woodworking processes at the Everett shops can in general be divided into two classes: (1) Repair jobs on rolling stock, and (2) production of materials or parts used in quantity by the company in any branch of its service. Ample facilities for quick repair are afforded by the trackage in this building and its connection with the transferway. Most of these tracks are carried at least two-thirds of the way across the building. To facilitate the work until future craneways are available two body hoists built by the company and a jib crane are installed in the northern portion of the shop.

The latest types of equipment of the mill include a rip saw, doweling machine, belt sander, high-speed shaper and a disk sander. These embody various features of design which increase the convenience of operation, render the work safer and reduce obstruction to the movement of men and materials in the mill. Several of the motors are mounted inside the machine frames or above the floor level and out of the way of the user. Control equipment is located as a rule within easy reach of the machine operator, and a general scheme of screening these tools and their drives adds to the safety of the installation. All tools above 7 hp. have General Electric switches, by which the compensators can be "killed" in connection with repair work. While the operations performed by these machines and other equipment were carried on to some extent in the older shops of the company, with this later equipment more rapid production is possible through easier settings of cutting devices, more automatic regulation of processes, multiple cutting and higher powered tools.

Some of the articles regularly made in the wood mill are cross arms, third rail shoe beams, seats for trainmen, surface car life guards, feeder switch boxes, track switch parts, toilet sets for stations, office furniture, trolley planks, car flooring and car doors. Repairs to cars brought into the shop on account of collisions or other accidents naturally take precedence over routine manufacturing operations.

Illustrating the routing methods followed attention



Conveniences for Wood Work in Boston "L" Shops

No. 1. Three-roll sander *(FF)*.

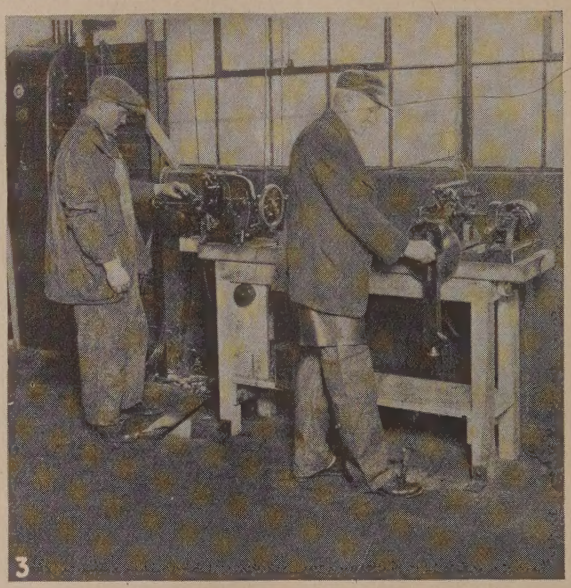
No. 2. Disk sander *(GG)*.

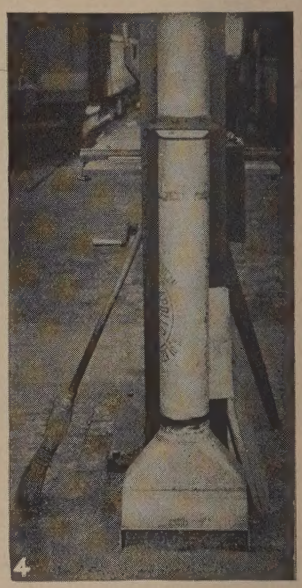
No. 3. Saw set and filing machines for band and circular saw *(II)*.

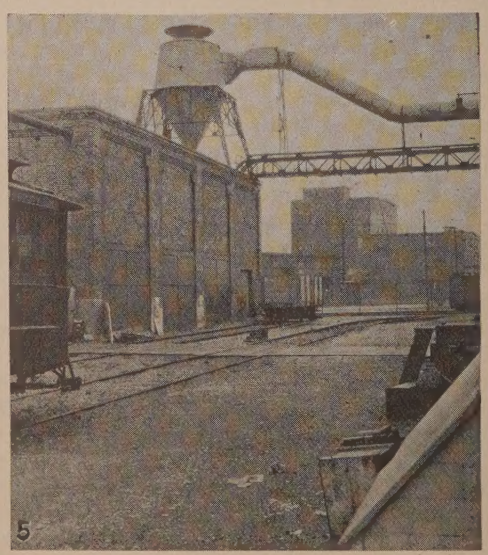
No. 4. Suction sweeper intake pipe for removal of floor refuse.

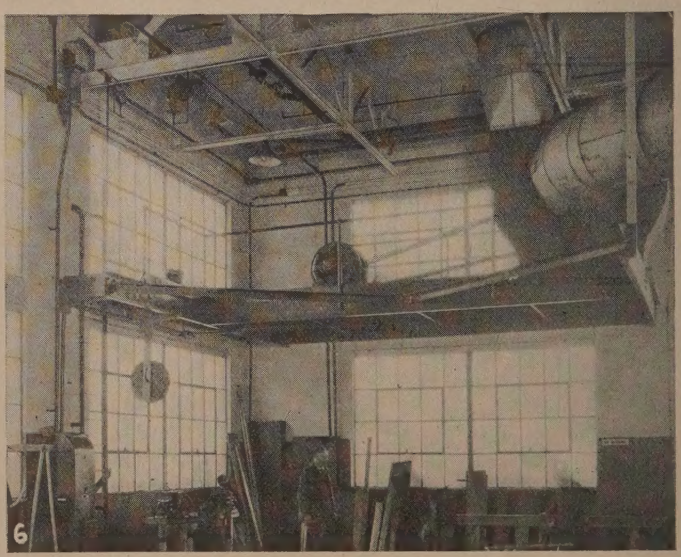
No. 5. The sawdust and shavings exhauster and collector.

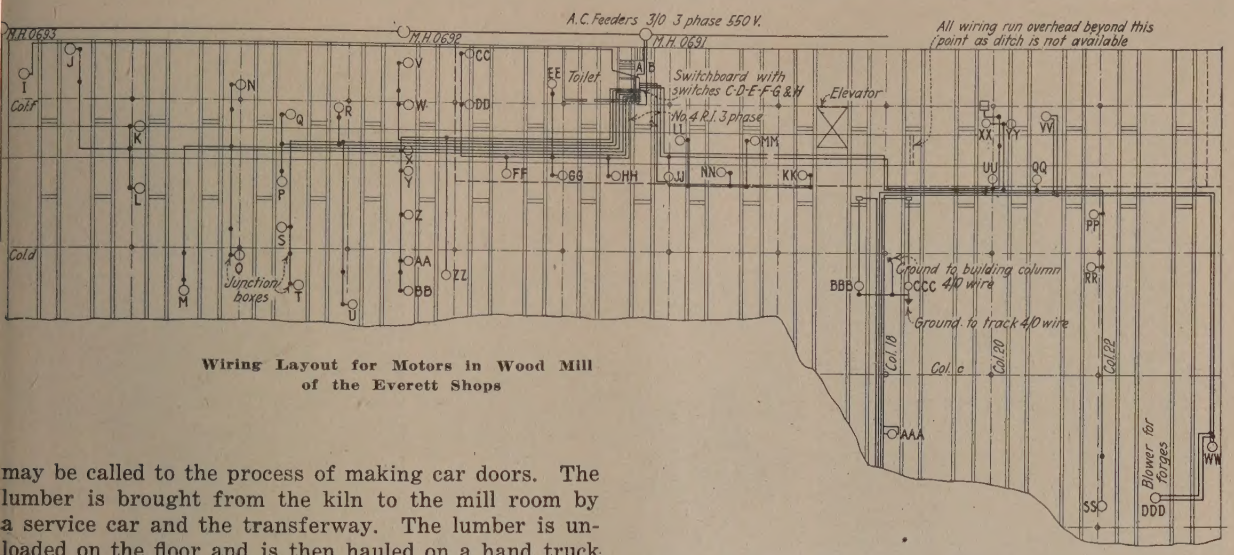
No. 6. An overhead mounting is used for the motor-driven blower of the sawdust removal system.











Wiring Layout for Motors in Wood Mill of the Everett Shops

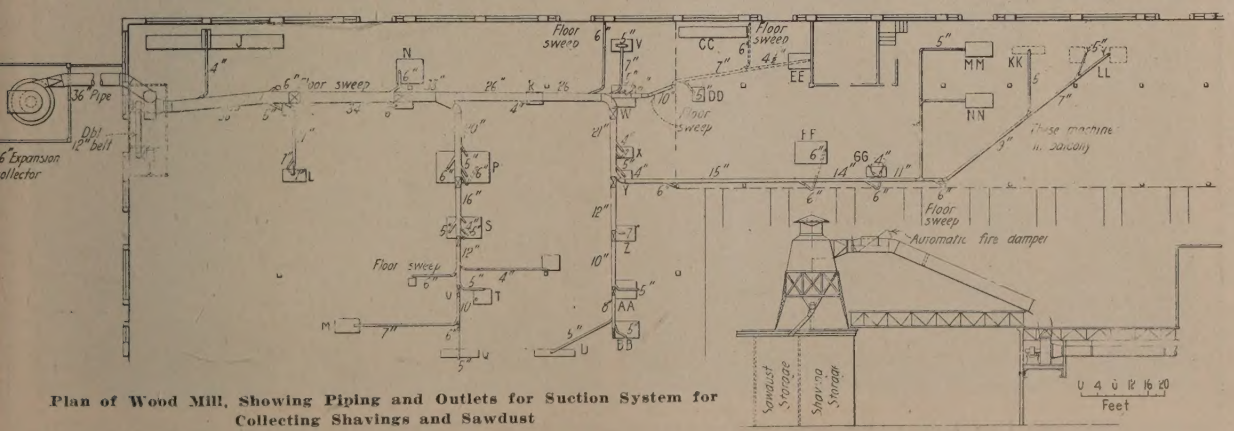
may be called to the process of making car doors. The lumber is brought from the kiln to the mill room by a service car and the transferway. The lumber is unloaded on the floor and is then hauled on a hand truck to the cut-off saw (*J*), where it is cut into lengths. It is next trucked to the rip saw (*K*) and cut into the desired widths. Thence it goes to the buzz planer (*Q*), where it is finished in two passes. The next machine used is the molder (*S*), which cuts the stock to the proper sizes. The stock then divides, the door stiles going to the mortiser (*Y*) and the rails to the tenoner (*X*). The stiles then pass to the shaper (*V*) for molding and thence to the carpenter shop in the balcony. The rails are also molded by this shaper and are then passed to the bevel saw (*AA*) for "relishing," after which the rails go to the balcony for assembly with the stiles. The door panels when glued together start with the cut-off saw (*J*) and pass through the buzz planer (*Q*) to the mortiser (*Z*), thence to the bevel saw (*AA*) for bringing to size, on to the sander (*FF*) and to the balcony for assembly. The doors are then taken to the mill room floor and edge-straightened in a buzz planer (*Q* or *U*). Next they are cut to the proper length and width on the bevel saw (*AA*), after which the sander (*FF*) is used, the edges are molded by the shaper (*V*), and the doors trucked to the paint shop. They are returned to the mill room for glazing. The beading is cut up in the rip saw (*J*), passes through the molder (*S*) to the paint shop and is returned to the mill for insertion at the time the glass is set. The completed door then goes to the paint shop for installation.

Window sash goes through practically the same operations as the doors. Steel paneling is largely replacing the wooden panels on the company's cars and this work is done in the temporary machine shop section of the wood mill, in the main.

Disposing of Wood Waste

The mill building is equipped with a dust and shavings removal system by which all sawdust and other débris are drawn by suction through branch piping into a heavy discharge main leading out of the building and across a bridge to a separating hopper on the top of the extension of the lumber storage building. An accompanying drawing gives the sizes of the various intake pipes leading from the various woodworking machines to the main collecting duct. The piping is supported on the trusses and columns of the building by wire guys and straps. On a balcony in the southwest corner of the wood mill is an 80-in. Sturtevant exhaust fan, belt driven by a 50-hp. motor. A suction of 2½ in. of water is produced when the fan is running at full speed.

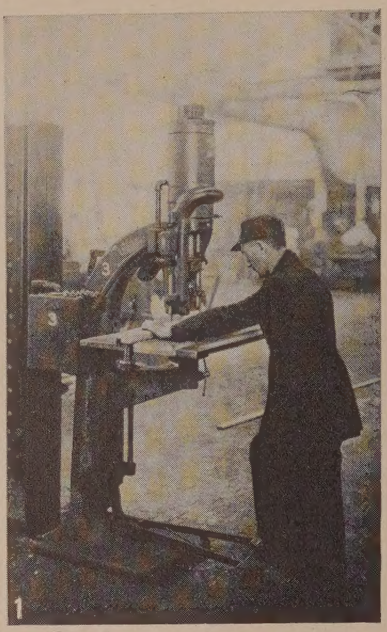
The dust and shavings are drawn from the machines and forced into a 36-in. trunk duct. They are discharged into a 36-in. collector with top and body of No. 18 and cone of No. 16 galvanized steel, carried on top of the baling house by structural steel supports. The hopper is about 18 ft. high and 12 ft. in diameter and is fitted with a ¼-in. mesh screen by which the sawdust and shavings are separated to discharge into compartments below where baling takes place in a 7.5-hp. Trojan baling machine. The bales of shavings,



Plan of Wood Mill, Showing Piping and Outlets for Suction System for Collecting Shavings and Sawdust

Some Special Woodworking Tools

No. 1. Vertical boring machine *(O)*.
No. 2. Double surfacer *(L)*.
No. 3. Routing machine *(W)*.
No. 4. Cut-off saw *(J)*.
No. 5. Belt sander *(EE)*.
No. 6. Tenoner, five motors *(X)*.
No. 7. Hollow chisel mortiser *(Y)*.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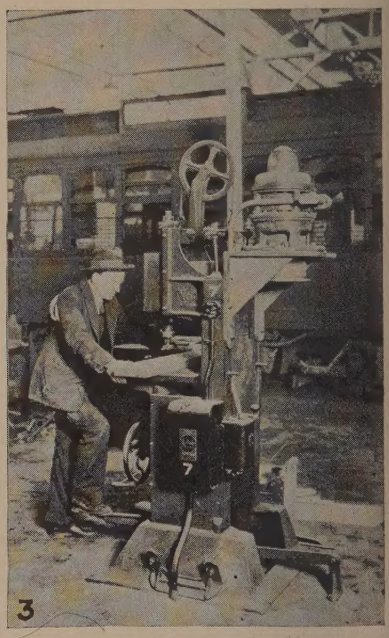
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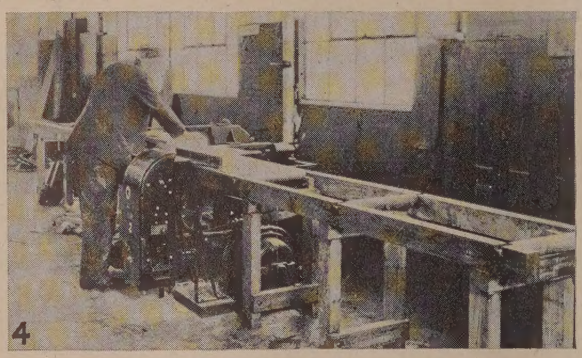
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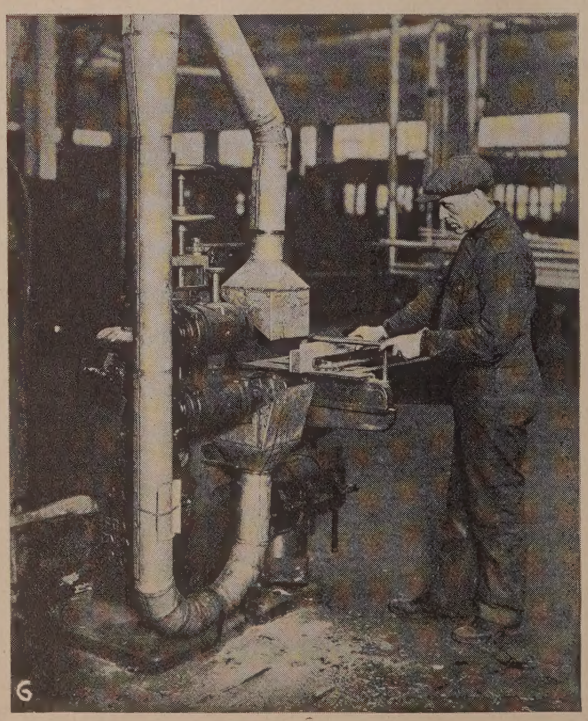
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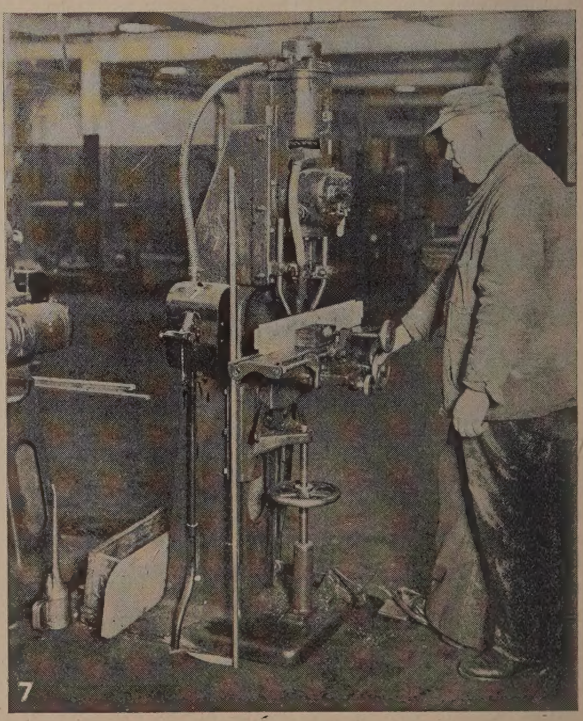
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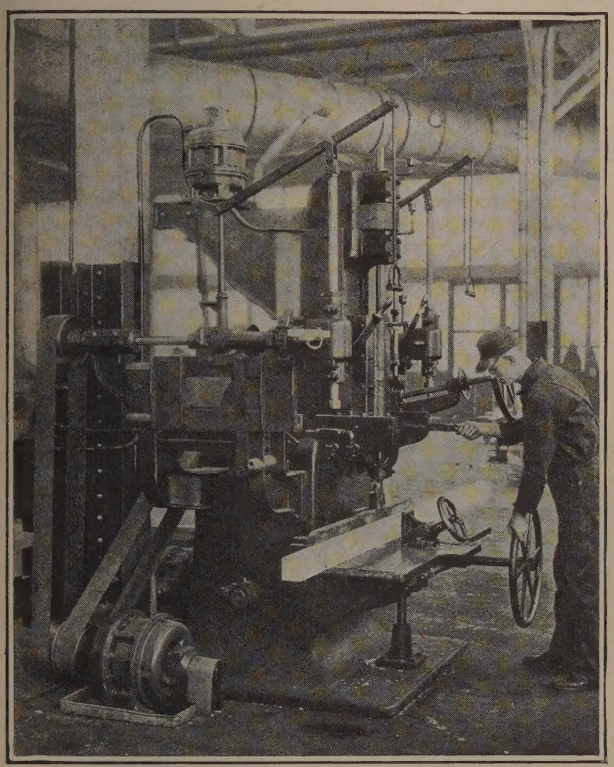
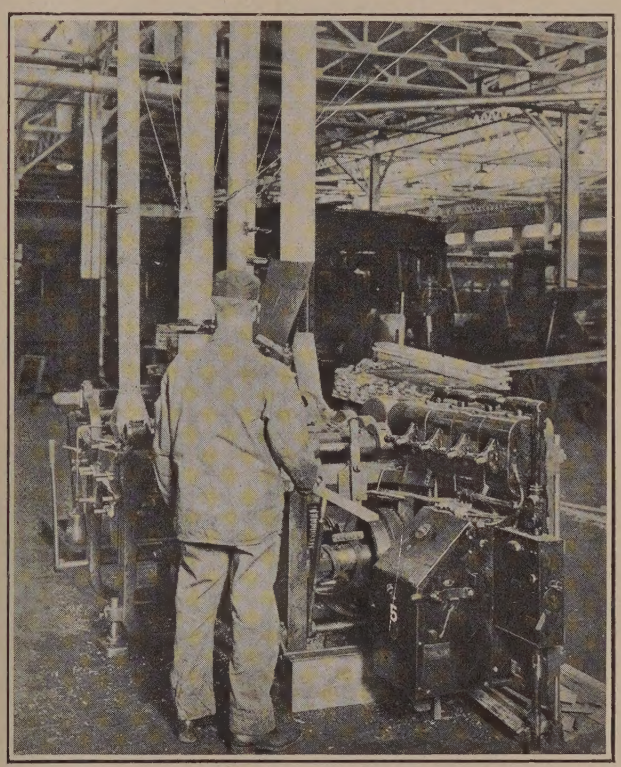
weighing about 80 lb. each, are sold to jobbers. Sawdust is bagged and sold.

A feature of the dust removal system is the installation of floor sweeps with suction openings at the floor level. These connect with the exhaust piping by 6-in. risers having dampers to reduce power requirements when the sweepers are not in operation. Each sweep has an orifice 2½ in. high and 15 in. long. The arrangement is shown in Fig. 4, page 1066.

The wood mill balcony also contains an upholstery shop, cabinet shop and locker room. On the ground floor is a stockroom for miscellaneous hardware used in car repairs and in the temporary machine shop. A temporary brass room also has been provided in the machine shop beyond the stock room. The upholstery shop chiefly repairs curtains, automobile cushions and canvas, there being few if any cushioned seats in the Boston cars.





At Left—Boring and Mortising Machine (N). At Right—Molder Equipped with Five Motors (S)

CONSTRUCTION OF THE BUILDING

The shop buildings are of concrete construction up to and including the first floor, with brick walls and steel sash, steel-supported roof, wood plank and Pond type skylights. The foundations are laid in soft ground. In the design of the roof particular attention was given to secure the maximum amount of daylight. In general the construction of the mill building and paint shop is uniform, although the woodworking shop is somewhat narrower. The skylights were designed with the lower half stationary and the upper half movable to give efficient ventilation. The operating sides are movable portions, are motor-driven and controlled by push-buttons from the ground floor. A run of 150 ft. represents the maximum which can be conveniently handled in a single section.

The wood shop has 22 tracks and a capacity of 36 cars of 50 ft. length. Pits are provided for 17 tracks. The entire floor of the building is paved with treated wood blocks. The southwest portion of the wood mill is used for general heavy woodwork and the northerly portion of the building is temporarily utilized for blacksmith, tin and machine shops, pending the construction of the metal-working shop north of the present building.

The finished floor was laid over the foundation after the rails were installed and the pits were constructed with a reinforced-concrete foundation. The pits are 4 ft. 7 in. deep from the top of the rail to the pit floor, with offset walls. The pit tracks are laid on tie plates anchored to the concrete and spaced on 24-in. centers, the rails being fastened by standard rail clips spot welded. A small amount of heat is available in the pits, pipe coils being run in the offset on one side. Light outlets are installed on the other side, with extension cords hung up so that they will be out of the way when not in use.

The transfer table, which was built by George P. Nichols & Brothers, Chicago, has a speed of 6⅔ m.p.h. and a weight loaded of 100 tons. It was found that it would be a considerable undertaking to provide a suitable bumper which would stop the table without damaging it, and so the engineers of the railway company installed a so-called natural bumper, with a slope of 30 deg., built of cinders covered with 6 to 8 in. of crushed stone. This has proved satisfactory, as the table will run into it without derailing and apparently without injurious result, either to the table or to the end wall of the transferway.

An Elwell-Parker 3,000-lb. industrial electric crane truck is used for many services about the shops, particularly in handling electric motors and other parts to and from the temporary machine shop, in moving

trailers on and off the transfer table and spotting cars on tracks.

At present 373 men are employed at the Everett shops.

Routine of Handling Cars Needing Repairs

When a car inspector, with the approval of a district supervisor, has sent a car to Everett it is placed on a side track to await inspection so as to determine just what repairs are needed. These often exceed the recommendations of the transportation department, as rotted sills and posts cannot be seen until the sheathing is stripped off and the frame exposed. When a berth in the shops becomes vacant, the next car scheduled for repairs is transferred from the yard to this berth.

As soon as a crew of men has completed another car, they are assigned to the one just placed in the shop. Their first duty is to strip the car unless it is one that has been painted comparatively recently and has just been involved in an accident. In this case the needed repairs are made, the paint is retouched and the car released. About 225 cars per year are sent into the shops on account of collisions.

When a car is stripped all window screens are removed, transferred to the machine shop for repairs and thence delivered to the paint shop for cleaning and dipping. Sash and doors are removed and sent to the sash and door department. The door-operating mechanism is taken down and thoroughly overhauled. Seats and backs are all put in first-class condition and sent to the paint shop for cleaning and repainting. The seat frames are all gone over and any found defective are removed and repaired. Metal and brass hardware is

MOTOR-DRIVEN WOOD MILL MACHINES IN EVERETT SHOPS, BOSTON ELEVATED RAILWAY

Ref. Letter	Description of Unit	Manufacturer	Motor Hp.	Motor Manufacturer	Motor Type	Motor Rpm.	Control Information
I	Blower, sawdust, 80-in.	Sturtevant	75	G. E.	KT 343	1,200	CR 1,034 G. E.
J	Cutoff saw No. 6	American	7.5	G. E.	KT 302	900	CR 1,034 G. E.
K	Rip saw No. 386	Fay & Egan	10	Watson	KH	3,400	D 3,783 Industrial Controller Company compensator
L	Double surfacer No. 140 A	Fay & Egan	10	L. Allis	KH	3,400	Louis Allis
			15	L. Allis	KH	3,400	Louis Allis
M	Band saw, 42-in.	Fay & Egan	10	G. E.	KT 752	1,800	Allen Bradley, KC, form E
N	Car mortiser	Greenlee	5	G. E.	Form C	1,800	Allen Bradley, auto starter
			10	G. E.	Form C	1,800	Allen Bradley, form E, KC
			3	G. E.	Form C	1,900	Allen Bradley, auto starter
O	Spindle borer	Greenlee	4	G. E.	Form D	3,600	CR 705 G. E., magnetic switch, push button
P	Inside molder, 13-in.	Rogers	25	G. E.	Form B	900	KC form E, G. E.
Q	Hand planer No. 506	Fay & Egan	5	F. & E.	Lightning	3,600	Westinghouse, WK 20
R	Band saw No. 50	Fay & Egan	5	G. E.	.....	1,800	G. E., CR 1,038
S	Molder No. 600	Fay & Egan	5	Watson	KH	3,400	G. E., CR 1,038
			3	L. Allis	KT 730	1,800	G. E., CR 1,038
			3	L. Allis	CT form A	3,400	G. E., CR 1,038
			3	L. Allis	.....	3,400	G. E., CR 1,038
			7.5	Watson	KH	3,400	D 3,783 Industrial Controller Co.
T	Universal saw No. 30	American	5	G. E.	Form C KT 731	1,800	CR 1,038 G. E.
U	Buzz planer, 16-in.	Rogers	3	G. E.	KT 715	3,600	Allen Bradley J 1,552, push button
V	Shaper No. 452 F	Fay & Egan	5	F. & E.	Lightning	6,800	CR 1,038, G. E.
			5	F. & E.	.....	6,800	CR 1,038, G. E.
			10	G. E.	KT 751 form C	1,800	CR 1,034
			7.5 kw.	L. Allis	(Generator)	1,800	.....
W	Tenoner No. 2	Houston	5	G. E.	KT 752 form C	.....	Allen Bradley, J 1,552
X	Tenoner No. 505	Fay & Egan	3½	F. & E.	KT 28 form D	3,600	CR. 1,038 G. E.
			2½	F. & E.	KT 16 form D	3,600	CR 1,038 G. E.
Y	Mortiser No. 510 A	Fay & Egan	5	F. & E.	CT form A	3,600	CR 1,038 G. E.
Z	Cabinet surfacer No. 156	Fay & Egan	10	F. & E.	KH form A	3,400	L. Allis D 3,783
AA	Bevel and miter saw No. 22	Pettingell	5	G. E.	KT 752	900	G. E., CR 1,038
BB	Universal wood worker	Fairbanks	5	G. E.	KT 731	1,800	.....
CC	Patternmaker's lathe No. 441	Fay & Egan	3	Wstn. Elec.	KT 730	1,800	G. E., CR 1,038
DD	Chamfering machine No. 294	Fay & Egan	5	G. E.	KT 731	1,800	G. E., CR 1,038
EE	Belt sander No. 6	American	2	G. E.	KT 731	1,200	G. E., CR 1,038
FF	Three-roll sander No. 393	Fay & Egan	1-7.5	Wstn. Elec.	KT 751	1,200	2 CR 1,034
			1-7.5	Wstn. Elec.	KT 952	1,200	
			1-3.0	Wstn. Elec.	KT 750	1,200	2 CR 1,038
			1-5	Wstn. Elec.	KT 752	1,200	
GG	Disk sander No. 446	Fay & Egan	1.5	"Superior"	.....	1,200	CR 1,038 G. E.
HH	Grindstone	American	1	G. E.	KT 711	1,800	CR 1,038 G. E.
II	Saw sharpeners: Circular and band saw	Wardwell	.....	Robbins & Myers	.....	.....	.....
JJ	Knife grinder No. 101	American	2	G. E.	KT 713	1,800	CR 1,038 G. E.
KK	Buzz planer, 16-in.		3	.....	.....	....	.....
LL	Universal saw	American	5	.....	.....	.....	.....
MM	Saw	Fairbanks	5	G. E.	KT 936	1,800	J 1,552 Allen Bradley
NN	Doweling and rod machine No. 7	Fay & Egan	5	G. E.	.....	1,800	CR 1,038 G. E.
		MACHINE SHOP					
PP	Squaring shears 8 E	Niagara	7.5	G. E.	KT 952	1,200	G. E. auto-compensator
QQ	Punch No. 36	Niagara	3	G. E.	KT 938	1,200	CR 1,038, G. E.
RR	Power rollers		3	G. E.	KT 732	1,200	CR 1,038 G. E.
SS	Hammer No. 1066	Nazel	7.5	G. E.	KT 952	1,200	CR 1,034 G. E.
TT	Circular shears No. 208 A	Niagara	3	G. E.	KT 938	1,200	CR 7,005 G. E., magnetic switch
UU	Emery wheel	U. S. Electric Tool Company	3	G. E.	KT 731	1,800	CR 7,005 push-button control G. E.
VV	Shop shafting		10	G. E.	RC-9	1,250	Type 2,102 monitor control
WW	Shop shafting		30	.....	.....	875	Old d.c. motor, 550 volts, trolley supply
XX	Buffer	U. S. Elec. Tool Co	5	G. E.	KT 731	3,600	CR 7,005 push-button control G. E.
YY	Buffer	U. S. Electric Tool Company	5	G. E.	KT 731	3,600	CR 7,005 push-button control G. E.
ZZ	Saw	American	5	.....	.....	....	.....
AAA	Crane hoist	Shepherd 5-ton	6	.....	.....	....	D. C. motor
BBB	Car body hoist		.....	G. E. 58	.....	....	.....
CCC	Car body hoist		.....	G. E. 58	.....	....	.....
FFF	Emery wheel		¼	Westinghouse	ES 8,731	....	Westinghouse WK 10 starter

MISCELLANEOUS EQUIPMENT

16 Heater blower motors, G. E., 5 hp., type KT 731, conduit type N 4 control.
1 15-kw. Fairbanks-Westinghouse-Crawford electric oven in wood mill.
2 Pump motors, 3 hp., 900 r.p.m., 550-volt, conduit type I starting switches.
Window sash mechanism, 16 G. E., KT 22-hp. motors; Fairbanks-Morse RC 4 starters.
2 Salem electric elevators, each with 30-hp. G. E. MT 332 motor and Cutler-Hammer control.
1 32-kw. Crawford-Westinghouse electric oven, ½-hp. blower motor.
1 7.5 Crawford-Westinghouse electric oven, Westinghouse type F magnetic contactor.

all removed and sent to the brass room for cleaning, repolishing and lacquering. If the car is old and shows indications of rotten framing it is further stripped of all outside sheathing and possibly the floor is removed.

From this point the rebuilding begins. All rotten portions, such as posts and framing, are removed carefully and sent to the mill, where exact duplicates are made, this being found more economical and quicker, with the modern machine tools available, than the old method of trying to fit new parts to the car at the repair track. The original timbers are cut in many ways to fit the contour of the car and to allow clearance for rivet heads, bolts, angles, etc. Sheathing plates, if badly corroded or bent, are sent to the sheet-metal department to be straightened or duplicated. Bumpers, if badly bent, are taken off, reheated and are then reshaped.

Gradually every part removed is returned to the car renovated or duplicated, the framing is replaced and spliced, the car resheathed, the floor laid and every detail gone over and made good. The doors and windows are put in and the car sent to the paint shop. There the final trimming of hardware is replaced, seats are put in and window screens are attached, glass cleaned and the final trimming is done just before the car is sent out.

Boston-Lowell Buses Run Express

Parlor Car Service Recently Established by the Eastern Massachusetts Street Railway on this 27-Mile Route Supplements the Rail Service Between These Cities

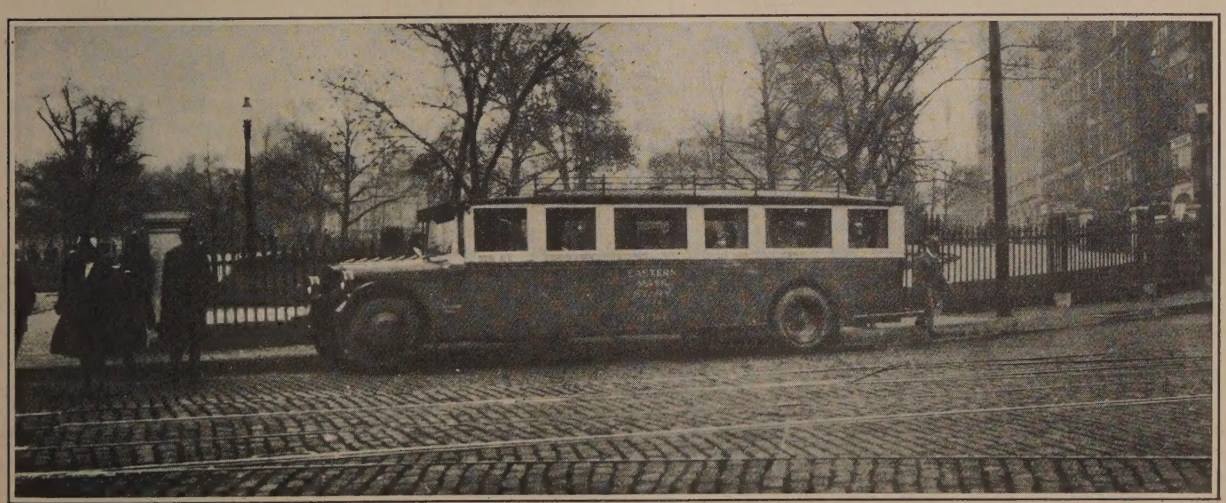
EXPRESS bus service or, as the railway prefers to call it, motor coach service between Boston and Lowell was inaugurated by the Eastern Massachusetts Street Railway on Oct. 1, 1924. To a certain extent this service takes the place of a street car route which was abandoned some time ago because of poor patronage. It serves also to supplement the service on an existing car route which is operated from Boston to Lowell via Chelsea. In order adequately to take care of local passengers it is necessary to make all stops along this line, and for that reason the company felt that it would be worth while to undertake express bus service for the through passengers between the two cities.

Park Square, Boston, is the southern terminus, and from there the route goes out Charles Street across the Charles River and then via Cambridge Street to Massachusetts Avenue, just beyond Harvard Square. Then it follows what is known as the "back road" to Lowell. This highway has recently been repaved by the State of Massachusetts. By following these streets from Boston through Cambridge the traffic congestion on the more popular streets is avoided and considerable time is saved.

The route is 27 miles long and the running time is approximately 1 hour and 10 minutes. This is slightly more than the ordinary running time of trains on the Boston & Main Railroad between these cities, and is considerably longer than the time of express trains. On the other hand, the fact that the buses start from the convenient Park Square terminus in Boston and reach a convenient point in the center of Lowell makes this service more attractive in that respect than the railroad service, which starts from and arrives at stations less centrally located. The fare on the bus is $1 and on the railroad 93 cents. At both ends of the line illuminated signs made of wire glass have been conspicuously placed on electric light poles to inform the public concerning the service.

Terminals Are Conveniently Located

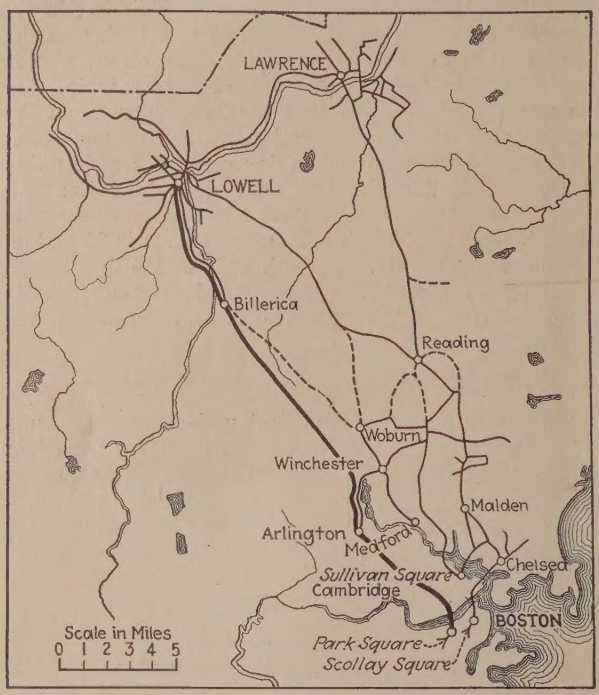
When this operation was first undertaken ten round trips were run per day, the first leaving Lowell at 7.30 a.m. and the last at 9.30 p.m. Leaving Boston the first trip was at 9 a.m. and the last at 11:15 p.m. Traffic has varied greatly from day to day, ranging between about 300-passengers as a minimum and 600 passengers as a maximum. For the first six weeks after the commencement of bus operation an uninterrupted period of fair weather prevailed. Saturday, Sunday and holiday riding has been heavy. Recently the increase in the number of passengers carried caused the railway to increase the service. On Nov. 8 an hourly headway throughout the day was established in both directions.



Express Bus Operated by the Eastern Massachusetts Street Railway Between Boston and Lowell Loading Passengers at the Park Square Terminus

Because the running time in each direction is slightly more than an hour, the company thought that it would be undesirable to try to operate an hourly headway with only two buses. For that reason three buses are now in service all day, with fairly long lay-overs at the ends of the line. By starting the trips from Lowell on the even hours and from Boston on the half-hours the lay-over time has been divided equally between the two places.

Five Fageol coaches are available for this service. On Saturday afternoons, however, when important football games were being played in Boston, it was necessary to augment the service by the use of street car type buses, borrowed from other routes operated by the railway. A plan is under consideration at present to increase the seating capacity of the Fageol coaches from 24 to 30.



Two Routes Are Operated by the Eastern Massachusetts Street Railway Between Boston and Lowell. Trolley Service Is Via Chelsea, While the Express Bus Service Operates Through Cambridge

The buses are maintained in a space specially set aside for that purpose in the carhouse at Lowell. An experienced automobile mechanic is employed to take care of them. Ordinarily each bus is inspected every third day, or at the end of approximately 600 miles of operation.

Part of the route, which is shown on the accompanying map, is on streets where the Boston Elevated Railway operates surface cars. Another part is on streets where the Eastern Massachusetts company operates. This will simplify the problem of snow removal in winter because the railway snow-fighting equipment can clear a considerable portion of the bus route. The stretch of road where the railway plows cannot operate is only a few miles in length. This being a state highway it is expected that the state will keep it clear. In an emergency, however, the railway is prepared to clear a path for its buses by means of snowplows on its heavy motor trucks.

In accordance with the laws of Massachusetts, the permit for the operation of this line is of only one year duration. Such short term license, however, is not the serious disadvantage to a bus line which it would be for a rail line. The company feels that there may be room for the establishment of similar routes in this territory. In general, however, it is thought that the replacement of railway lines by bus lines has already proceeded in Eastern Massachusetts about as far as it is likely to go.

Giving the Riders Somewhere to Go*

Charleston Consolidated Railway & Lighting Company Leased an Amusement Park and Made a Profit of Nearly 120 per Cent in Two Months

AT ONE time the comment was often heard concerning the street railway in Charleston, S. C., that "It doesn't take you anywhere." In other words, the various routes linked the business and residence districts together but they reached practically no amusement resorts. There are two parks for white people, but in spite of the great natural beauty which they possess, they have not attracted many pleasure seekers. The railway considered the possibility of converting these parks into sources of traffic for itself, but it was felt that a large majority of the frequenters of the parks were automobile owners and that it was not worth while to try to build up an amusement resort for white people.

With the colored people, however, the situation is different. A property known as Grant Park, located on a suburban line about a mile beyond the city limits, was successfully operated by the railway before the war. In the spring of this year it was decided to negotiate with the owner of this park with a view to its operation during the summer. An agreement was reached whereby the railway paid $250 toward the renovation of the buildings and agreed to furnish music and prizes for dances to be held at the park.

Tickets were furnished by the conductors to colored passengers alighting from the cars at Grant Park. On nights when dances, band concerts, or picnics were held, these tickets entitled the possessor to free entrance. All such tickets collected above 150 in number were redeemable, if presented by the owner of the park to the management of the railway, at 2½ cents each. The first 150 collected each day were used to reimburse the railway for its expense in furnishing music and other entertainment features.

During the first two months' operation the railway carried approximately 8,000 park passengers at 25 cents per round trip, making a total of $2,000. The largest single item of expense to the company was the extra service run to the park. This cost somewhat over $400 and the other expenses brought the total to slightly more than $900. The net profit of the operation was therefore in the neighborhood of $1,100. This experience has convinced the railway that it can profitably increase its park appropriation for another year. It proves, in the opinion of the management, that it pays to give the riders "somewhere to go."

*This article is based on material included in the brief submitted to the Charles A. Coffin Prize Committee of the American Electric Railway Association by the company named.

Many Railway Improvements in Central Pennsylvania

New Cars, Extensive Track Reconstruction, Better Shop Facilities and Bus Operation Are Among the Recent Developments at Johnstown, Altoona, Harrisburg and York

By Spectator

PENNSYLVANIA is always an interesting state from an electric railway point of view. It has more individual companies than has any other state in the Union and its total electric railway mileage is exceeded only by that of New York. It is particularly interesting, however, on account of the number of up-to-date street railway systems in its moderate-sized cities. Johnstown, Altoona, Harrisburg and York are four such cities, ranging in population from about 50,000 to 75,000 and located comparatively close together in the central part of the state. In all of them important improvements have lately been made in track, shops and rolling stock.

The Center of the Square at York Is Reserved as a Loading Area for Trolley Passengers

Considering the size of Johnstown, which is credited with a population of only 67,327 by the census of 1920, a surprisingly large outlay has been made by the Johnstown Traction Company to improve its service during the last few years. Since the beginning of 1920 more than $850,000 has been expended for track reconstruction and paving. Every year the amount spent for this work has increased, as shown in the following table, which was published in a newspaper advertisment wherein the railway explained some of its problems to the public.

1920	$105,029
1921	140,721
1922	143,331
1923	222,869
1924	239,520

Installation of an extensive new system of sewers in the city has necessitated much of the track reconstruction. This new system is not yet completed and the railway is faced with the necessity of making similar large expenditures for some time to come.

These heavy demands upon the company were one reason for an application filed in the fall of this year with the Public Service Commission for a slight increase in fare. This was put into effect in September. The ticket rate was increased from four for 28 cents to four for 30 cents, or, in other words, from 7 cents to 7½ cents per ride, while the cash rate was increased from 7 cents to 10 cents. There has been practically no opposition to this increase because most people realize the reasonableness of it. One interesting result, however, has been the greatly increased use of tickets. This has grown by leaps and bounds until now 98 per cent of the revenue passengers use tickets. In fact, strangers in the city are almost the only ones who pay the 10-cent cash fare.

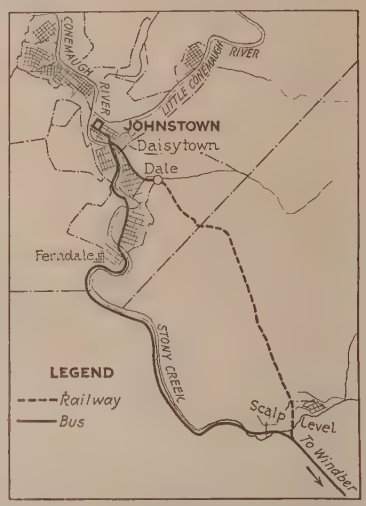
The railway is gradually extending the use of one-man cars by rebuilding some of its older rolling stock. In the reconstruction of a number of double-truck cars for one-man operation, the seating arrangement has been altered with a view to encouraging passengers to move to the rear of the car. Formerly these cars had longitudinal seats and were operated with rear entrance and front exit. Now, however, five cross seats have been installed on each side at the back end and the heater has been moved from the middle of the car to the back platform. In place of the old rear entrance door a small emergency door has been provided. On the far side of the rear platform has been placed a semi-circular seat. By this means the total seating capacity of the car has been increased somewhat and it has been found that the universal desire to ride in cross seats causes passengers to move to the rear of the car.

Soon after the completion of a new concrete state road between Johnstown and Windber applications were made by a number of independent bus operators to run over this route. Windber is a mining town of about 12,000 inhabitants. The traction company, however, operates an interurban line between these places, and it was felt that competitive bus operation between the same points would be likely to affect its revenue seriously. Accordingly the railway itself made application to operate bus service over such portions of the route as were not conveniently served by its cars.

At some places the state highway is as much as 3 miles away from the car line and the bus route was laid out with a view to serving the people living in this

district. The railway line goes all the way to Windber, a distance of approximately 12 miles. The bus line, however, stops at Scalp Level, about 9 miles from Johnstown. The company felt that bus operation between Scalp Level and Windber would be only a needless duplication of its existing service.

The bus route begins at the end of the city car line in Dale Boro, as shown on the accompanying map. The fare is 40 cents to Scalp Level, including the fare on the connecting city car line. Inbound a free transfer is given from bus to car. This rate is considerably higher than the fare on the electric line, which is only 30 cents through to Windber. A single bus is operated on a one-hour headway, covering about 200 miles per day. On weekdays the passengers number about 200, but on Saturdays more are carried. On account of the many severe grades in this territory bus operation is expensive and the line shows a considerable loss. Nevertheless this is to be preferred to having independent bus operation on the route.



Bus and Car Routes Between Johnstown, Scalp Level and Windber, Pa.

Two other short bus routes are operated by the company. These are feeder lines into districts not served by the cars. All these bus operations are carried on under the name of the Traction Bus Company. An interesting characteristic of the service is that each driver has his own bus. When a relief is made not only is the operator changed, but also the bus itself. This method, the company has found, results in the driver taking a greater interest in the care of the vehicle. In all, five buses are owned, three of which are in regular service while two are spares.

Railway service between Johnstown and Windber has also been improved recently. Three new light-weight interurban cars were purchased from the Kuhlman Car Company and placed in service during the summer. These cars are operated by two men and the headway is 40 minutes, or slightly shorter than the bus headway. The railway is now considering the purchase of some more new cars.

Changes at Altoona

A striking change is soon to come over the railway situation in Altoona. The color of the cars is to be changed from dark green to cadmium yellow. This will be a great improvement and should have a distinct tendency to encourage riding. Due to climatic conditions and the fact that it is a great railroad center, Altoona often has a rather gloomy aspect. Despite the best efforts of the shop department to keep them fresh looking the dark green street cars blend altogether too well with the murky atmosphere.

In making this change the company is following the precedent which it set when selecting a color scheme for its buses. The buses operated by the Altoona & Logan Valley Electric Railway have a bright red body and a yellow roof. A yellow band encircles the body just below the window. On this the name "Logan Valley" is painted in blue letters.

Like many other and bigger towns Altoona, which has a population of approximately 60,000, is worrying about traffic congestion. A survey of street traffic was recently made by the railway at one of the busiest intersections in the downtown district. This count was made from 8 a.m. to 6 p.m., and it was found that street cars comprising only 7.8 per cent of the total number of vehicles carry 74 per cent of all passengers. The figures for various types of vehicles follow:

	Vehicles	Passengers
Autos and trucks	6,401	12,802
Street cars	556	36,000
Motorcycles	18	18
Bicycles	162	162
Horse drawn	22	22
Total	7,159	49,004

Expressed in terms of lineal feet of street space occupied, 100 passengers in street cars require 60 ft., whereas the same number in automobiles require 750 ft. Even with the larger traffic carried, the street cars during the 10 hours of the survey occupied less than one-third the street area taken by the automobiles. These data have been presented to the police department for consideration in connection with their study of the traffic problem.

Left—The Scalp Level Bus Meets the City Car Line at Dale Boro. Right—One of the New Light-Weight Interurban Cars Operated on the Windber Line of the Johnstown Traction Company

The Square at Harrisburg. The Railway Here Is Fortunate in Having Rolling Stock of Uniform Appearance

A number of streets in the business district of Altoona are now restricted to movement in one direction. There is some talk of changing the direction of traffic on two of these streets. Such a change would involve rerouting of the cars and the installation of new special work. Along with this it is planned to install a system of interlocked traffic signal lights. Just why the city wants to do this is difficult to understand. The arrangement of streets and traffic conditions at the different intersections are such as to make it practically impossible that interlocked signals would facilitate traffic movement. On the other hand, they would undoubtedly be a considerable hindrance to the 74 per cent of the people who ride in street cars.

In its shops the railway is carrying out a number of important although not spectacular improvements. Some new machine tools that have been installed have given very satisfactory service and it is planned to purchase others. Improvements have been made also in the power house, particularly in the arrangement of switches and control panels. The railway buys power from the Penn Central Light & Power Company, but it maintains sufficient facilities of its own to operate in an emergency. Ordinarily its own power station takes care of the steady, all day load and relies upon the Penn Central to carry the peak.

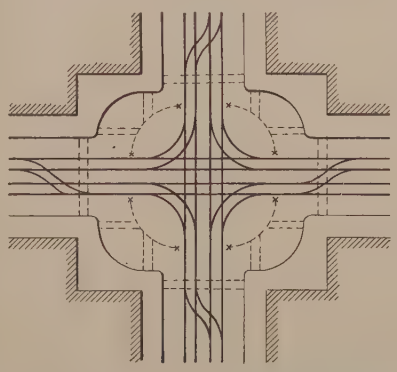
Pull-ins Reduced at Harrisburg

Probably the most interesting thing which has recently been done by the Harrisburg Railways is the reduction in the number of pull-ins. Since the first of the year the average number of car-miles per pull-in has been increased from somewhat less than 3,000 to nearly 15,000. This has come about as the result of a systematic campaign to determine the reason for every pull-in and to eliminate those causes which were responsible for the greatest number. Much improvement has been effected since the installation of dipping and baking facilities at the shop. These will be described in a separate article in ELECTRIC RAILWAY JOURNAL. A change in the kind of waste used in packing journal boxes was another move which is thought to be responsible for the elimination of many pull-ins.

As at Johnstown, large sums have been expended for track reconstruction. Nearly $250,000 has been spent during the past year for the rebuilding of about 5 miles of track. For most of this work International steel ties were used. Asphalt is used widely for street paving in Harrisburg, and the railway favors a rigid type of track structure.

Here, too, yellow is the color of the car exteriors, but in Harrisburg it is not an innovation as it is at Altoona. The rolling stock is kept well painted and is all more or less uniform in appearance. This results from the fact that the railway was able to secure a considerable number of modern cars a few years ago when prices were lower and all the older cars were retired from service.

Across the Susquehanna River at Lemoyne the Valley Railways has been making improvements, too. Some of its cars have been rebuilt with an arch roof replacing the old monitor deck. Steel plates have been used on the exterior to cover the old wood sides and give the car a more attractive appearance. Rumors are afloat concerning the possible sale of this railway to a holding company, but no definite announcements have yet been made.



City Cars Leave the Central Square at York, Pa., on the Hour and at 5-Minute Intervals Thereafter

In the late fall the York Railways commenced the operation of new light-weight cars on the Red Lion and Windsor line. This is a 13-mile interurban line with single track and turnouts. The running time outbound from York is 46 minutes and inbound it is 52 minutes. There are two reasons for the difference—one being that the inbound route from Windsor to Red Lion is generally uphill, and the other that a 3-minute layover occurs inbound at Red Lion.

An Interior View of the New Interurban Car of the York Railways, Showing the Linoleum Floor Covering and Arm Rests

The cars were built by the J. G. Brill Company and one of them was on exhibition at the American Electric Railway convention at Atlantic City. As delivered by the manufacturer the car weighs 38,962 lb., but the actual operating weight is 39,400 lb. Four General Electric No. 247 motors are used per car.

In general appearance the new cars differ somewhat from any heretofore used by this company. The sides are curved and an arched window has been placed in each corner. The sides of the car are of Plymetl and the roof is of Haskelite. Special pains have been taken to make the interior of the car attractive. The floor has been covered with linoleum and arm rests are provided for the seats. The interior finish is light mahogany and an interesting feature is that all piping, etc., has been painted in accordance with the interior finish to make it as inconspicuous as possible. Seats are on 33-in. centers. Altogether seating accommodations for 52 passengers are provided.

These cars replaced older equipment weighing 55,000 lb. An important reduction has been effected in the energy used. Three cars of this type, enough to equip this line with one to spare, have been purchased. Two similar cars but of smaller capacity have been ordered for use in city service.

In common with many Pennsylvania towns the city of York has a central square, where the two principal business streets intersect. By painting white lines on the pavement and placing stanchions at intervals the city has laid off a circular area in the center where trolley passengers may wait for their cars. All vehicles other than trolley cars crossing the square must follow a circular path around the outside end of the loading area. Vehicular movements are controlled by interlocked electric light signals at each approach. These are so arranged that wheeled traffic stops and goes simultaneously, while pedestrians have the right of way on all crosswalks during the intervals between vehicular movements.

All the car routes of the York Railways reach this square. On one street two city lines operate on a 10-minute headway, giving a 5-minute joint spacing. On the other street three lines operate, each on a 15-minute headway, giving a similar 5-minute service. Schedules have been so arranged that connecting cars meet at the square. Cars discharge passengers before crossing the intersection and then proceed to the far side to load. On the hour and at 5-minute periods after the hour three or four cars leave the square simultaneously in different directions.

On account of the large number of railroad crossings at grade and also because of the comparatively high schedule speed of the street railway, two-man cars are operated on most of the lines. These are single-truck cars weighing 23,500 lb., built by the J. G. Brill Company in 1922. General Electric No. 247 motors are used with 26-in. wheels. The schedule speed is 10.3 m.p.h. and the cost of operation averages somewhat below 30 cents per car-mile. The present rolling stock on these city lines will soon be augmented by the new cars already mentioned.

An interurban bus line from York through Loganville and Shrewsbury to Turnpike has been operated by the York Railways for about a year. Bus operation is carried out under the name of the York Transit Company, a subsidiary of the railway. This company also operates two other bus routes, which have been so poorly patronized that application was made to the Pennsylvania Public Service Commission for their discontinuance, as told in the ELECTRIC RAILWAY JOURNAL for Nov. 29. The results on the Turnpike route, however, have been more encouraging, and up to the present this line has been paying a little more than its operating expenses.

The length of the route is 14.15 miles one way and through fare is 65 cents. For intermediate points, the fare averages between 4 cents and 5 cents a mile. Commutation rates are in effect for those who use the service regularly. On weekdays three round trips are operated, while five trips are made on Saturday and two on Sunday.

New Cars of This Type Have Reduced Energy Consumption on the Windsor Line of the York Railways

New Fageol Bus Loading in Front of the Traction Office at York Before Starting for Turnpike

A new 29-passenger Fageol bus was recently placed in service on this route. Cars of the railway are painted green, but the color scheme of the bus is orange and royal blue, with a gray roof. The reason for the adoption of these colors was the desire to give the vehicle a distinctive appearance and attract public notice. It is expected that with this new bus the operating cost will be lower and that the traffic will be increased.

An outstanding feature of the electric railway situation throughout the state of Pennsylvania is the freedom from cut-throat bus competition. The attitude taken by the Public Service Commission is an eminently fair one. No needless duplication of service is permitted, and the railways have thereby been enabled to improve their facilities to a greater extent than would have been possible if they had been constantly harassed by uneconomic competition. On their part the railways have done much to supply feeder service.

Work of the Baltimore Mileage Bureau*

New System Installed Obtains Mileage by Lines, Days, Individual Cars, Etc.—Automatic Tabulating Machines Make Calculation for Any Desired Classification Quick and Accurate

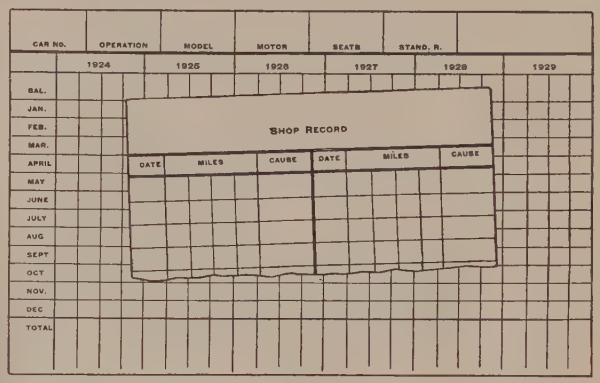
BEING dissatisfied with the accuracy and completeness of its car-mile figures, the United Railways & Electric Company of Baltimore, Md., installed a new system of recording mileage, beginning with Jan. 1, 1924. This was done with the idea of increasing the accuracy of its figures, reducing the bulk of the record, and at the same time making available to the operating department a larger amount of information than it had previously been able to secure.

This company operates approximately 1,500 cars over 35 lines. Each line, however, has a number of runs, a run being defined as a trip over a designated route between designated termini, so that, all told, the system must care for approximately 200 different runs. The total mileage for each of these runs must be determined daily and checked against the schedule requirements. There must also be a monthly and an annual summary of the mileage by runs, by lines, and for the system as a whole, as a general measure of the service that is rendered.

The true measure of service is not so much the car-mile as the seat-mile and also, though to a lesser extent, the standing room-mile or the product of the standing capacity in excess of the seating capacity into the car-miles run.

In addition to this service information, the mechanical department desires to know the total number of miles operated by each car, not only from month to month but also between any important alterations, such as a replacement of a motor, turning down or replacement of wheels, repainting or other important repairs. It also desires to know the total mileage run by each type of car, by each type of car motor, and by individual groups of cars having any one of a number of common characteristics. It is also necessary to distinguish between various types of operation. For example, the company runs unit motor cars, trains of one motor car with one trailer, trains of two motor cars, trains of two motor cars and one trailer, and trains of three motor cars. It is desirable to have an individual record of the mileage made by each car, in addition to the mileage of each type of train in such operation.

The system of recording mileage is based on the use of automatic tabulating machines. The basic information furnished by the line superintendents at the various carhouses is arranged to make the tabulating easy.



The Permanent Index Is on 5-In. x 8-In. Cards, Which Carry the Monthly Figures for 6 Years and on the Back a Record of Pull-Ins

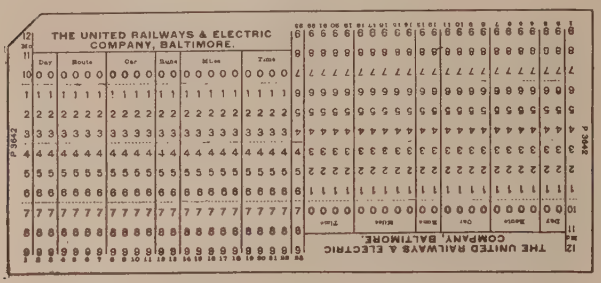
Each run is given a code number, the first two figures of which indicate the line and the last two the particular run on that line. Each morning a report of the previous day's operation is sent in on a form which contains the code number, the number of each car operated during the previous 24 hours, whether motor or trailer, and the number of trips of each type of operation made on that particular route. The line superintendent totals the number of trips and signs the report.

Each line superintendent is furnished by the traffic department with a number of schedules corresponding to variations in service from day to day during the week. When it is necessary to vary the runs from the schedule, in order to give extra trips or to curtail the service, due to temporary conditions, it is reported on a single sheet for each line. The report slips of all the runs on a given line and the reports showing variations from the standard schedule for that line are placed in a single envelope $4\frac{3}{4}$ x 11 in., as shown in an accompanying illustration. This envelope is indorsed with the date, the number of the line, the number of the schedule operated and with check marks opposite the last two numbers of the run codes which are to be found within the envelope. The envelope is then signed by the line superintendent and forwarded to the mileage bureau.

At the mileage bureau the slips for the individual runs are first verified as to their coding and as to the total number of trips made. This is then checked with the schedule requirements for the day, to determine whether the report of extra and short runs is accurate.

*This article is based on material included in the brief submitted to the Charles A. Coffin Prize Committee of the American Electric Railway Association by the company named.

The slips are then passed to a punch operator, who punches a run master card of the ordinary type used with automatic tabulating machines. The punch card contains columns for the month, day, trip, car number, route, trips, card count, miles, and minutes. A line master card, using the same form, is then punched and the listing by lines, with a grand total for the system, is added to the previous listing. The com-



One of the Punch Cards for Tabulating Individual Car Records

pleted listing, together with the totals of the reports on extra and short runs, is then forwarded to the traffic department for its records.

Meanwhile the original report slips have gone back to the punch operators, who punch a card for each car operated on each run. This card, shown in one of the illustrations, contains columns for month, day, route number, car number, number of runs, number of miles, and time. In order to determine the number of miles and minutes operated, a series of mileage tables has been prepared covering any trip likely to be run by a car within the 24-hour period. A typical table of this sort is illustrated herewith. In practice, however, it is not necessary to punch the minutes on anything but the run master card. These cards are then listed and verified and compared with the totals for the individual runs and lines already completed.

Every 10 days cards for individual cars are sorted and filed by car numbers, and at the end of each month the entire list of cards for that month is listed and totaled by individual car numbers. This gives the total car mileage for each car during the month.

It will be noted that the car card is reversible and can be used a second time. The 23d column is divided. The half belonging to each end of the card is used to designate the type of operation. Before the cars are sorted by car numbers, they are first sorted for type of operation, so that the final record at the end of the month shows not only the mileage for each car, but also the type or types of service which the car rendered.

When the monthly listing is complete, the totals for each car are posted to the permanent index, consisting of a 5 x 8-in. card, illustrated herewith. The card is arranged to carry the monthly figures for a period of 6 years. For the sake of convenience, single-unit car operation is indicated by a white card, while the various other types of operation are shown on colored cards. It is obvious that by an inspection of this card, the total mileage of any individual car may be determined quickly from the beginning of the system down to the end of any particular month. It is not possible, however, to determine the mileage to any date other than the end of a month.

When car mileage is desired up to intermediate dates, it is invariably in connection with some shop operation. To prepare the record, the shop is required to report daily the car numbers of all cars entering the shop, and before the cars for that particular car are listed for that month, they are first listed and totaled up to the date on which they entered the shop. This record is entered on the back of the same card, together with the total mileage of the car from the beginning of the system up to the date when it entered the shop. Obviously, the mileage between any two shopping dates is the difference between the two figures opposite those

TYPICAL MILEAGE TABLE
EDMONDSON AVENUE LINE, FROM WINDSOR HILL MONUMENT AND 11TH STREET

Runs	Miles	Minutes	Runs	Miles	Minutes
1	17.62	122	11	193.82	1,342
2	35.24	244	12	211.44	1,464
3	52.86	366	13	229.06	1,586
4	70.48	488	14	246.68	1,708
5	88.10	610	15	264.30	1,830
6	105.72	732	16	281.92	1,952
7	123.34	854	17	299.54	2,074
8	140.96	976	18	317.16	2,196
9	158.58	1,098	19	334.78	2,318
10	176.20	1,220	20	352.40	2,440

Form L-421 10M 8-24

THE UNITED RAILWAYS & ELECTRIC CO.
BALTIMORE, MARYLAND

Line No._____

This contains the mileage reports for_____, 19____, for the runs checked

	10	20	30	40	50	60	70	80	90
01	11	21	31	41	51	61	71	81	91
02	12	22	32	42	52	62	72	82	92
03	13	23	33	43	53	63	73	83	93
04	14	24	34	44	54	64	74	84	94
05	15	25	35	45	55	65	75	85	95
06	16	26	36	46	56	66	76	86	96
07	17	27	37	47	57	67	77	87	97
08	18	28	38	48	58	68	78	88	98
09	19	29	39	49	59	69	79	89	99

Line Superintendent

Individual Mileage Reports for a Line Are Placed in This Envelope for Transmission to the Mileage Bureau

dates on the back of the card, and no necessity remains for preserving the original punched cards for that month.

At the end of the month a set of car master cards is punched, showing for each car its number, type of operation, car model, motor type, seating capacity, and standing room capacity. These master cards are sorted mechanically under each of the above classifications, listed and totaled. In this way, the total mileage made during the month in each class of service is determined for each class of car and each type of motor. The total number of miles run by a group of cars with a common seating capacity or a common standing room capacity is then multiplied by that capacity and the sum total of these products is the total seat-miles or the total standing room-miles furnished as a matter of public service.

Special Car Mileage

A serious problem encountered was that of chartered cars or special or occasional trips that could not be coded as running over any particular route. The report made out by the line superintendent for such a car gives the car number and the description by streets of the route which it travels. The determination of the total distance in a complicated system, such as that of Baltimore, has involved in the past an amount of time altogether disproportionate to the value of the information.

In order to handle the problem, a special map of the system has been devised, in which the distance scale is entirely disregarded, the only effort being to indicate each line of track by a line on the map so as to be able to indicate by street names each piece of track and further to indicate all intersecting track by an intersection of lines on the map. All cross-overs, carhouses, or other terminal points are indicated by cross marks on the line representing a given stretch of track. The map is drawn in four colors, and the distances pertaining to each line are written thereon in the same color as the line. These colors are so distributed that no line of a given color at any point in its course meets another line of the same color. Each color stretch is treated as an individual piece of track, with a zero at one end of the line, and the distance is marked in the same color from this zero station to every carhouse or other terminal point, cross-over or connecting curve where cars could turn back or get off the route.

The movement of each special car is reported to the mileage bureau with a description of its route by streets. From this description it is easy to set down the distance from the zero station to the point at which the special car enters and leaves each individual color stretch, the greater of the two numbers being placed in the left-hand column and the lesser in the right-hand column. When the entire trip has been posted, the total in the left-hand column minus the total in the right-hand column gives the total mileage for the trip.

With this system it is possible to report to the traffic department before the close of each day's business the total number of trips, the mileage and the car-hours for the previous day on each run, on each line and on the entire system. The mail-car mileage, chartered car mileage, work-car mileage, and supply-car mileage are also computed. At the same time, there is given a list of all variations from the standard schedule, including the number of extra and short trips and the extra and short mileage.

Inspection Schedule Reduces Accidents

Specified Dates Each Month Used for Consideration of Certain Operating Points Reduced Number of Accidents in El Paso Remarkably in Two-Year Period

EARLY in 1923 the method of inspection of trainmen was changed radically by the El Paso Electric Railway, El Paso, Tex. The new plan was adopted as part of a campaign on the part of the company, under the leadership of Alba H. Warren, for the reduction of accidents. The campaign as a whole was described in considerable detail in ELECTRIC RAILWAY JOURNAL for Dec. 22, 1923, page 1047. Instead of having the inspectors make only general observations when watching the operators, they were requested to look for certain specified items on the various days of the month, according to the schedule shown in Table I. This schedule made it a requirement that particular attention be paid twice each month to each of the points listed, although of course the inspectors continually instruct the men in regard to all the requirements of the company.

TABLE I—MONTHLY SCHEDULE USED BY TRANSPORTATION DEPARTMENT INSPECTORS IN EL PASO, TEX.

Day of Month	Special Matter Under Investigation
1 and 16	Proper feeding.
2 and 17	Careful operation at railroad crossings and special trackwork.
3 and 18	Speed of cars, safety stops, junctions and slow signs.
4 and 19	Caution at "blind" corners.
5 and 20	Courtesy, personal neatness and cleanliness.
6 and 21	Car spacing.
7 and 22	Passing automobiles and care in traffic.
8 and 23	Gong ringing.
9 and 24	Reports, car defects, accidents.
10 and 25	Power consumption.
11 and 26	Warning signs to autoists and maintenance.
12 and 27	General inspection of overhead, slow signs, etc.
13 and 28	Railroad crossing signs or markers at danger points.
14 and 29	Signal lights, headway recorders and electric switches.
15 and 30	Condition of track and landings.
31	General review.

The result of the new method of inspection was that all the men were kept constantly on their toes to observe and to report anything that could improve the service or reduce accidents. By maintaining this system of bringing out the points which an operator should be observing at all times, the men were prevented from losing interest in their work.

The result has been a material improvement in the operation. That it has been a big factor in reducing accidents is shown by Table II, accidents having been reduced from 1,462 in the first ten months of 1921 to 495 for the corresponding 10 months of this year. The record is improving steadily, the best record being that for October of this year, with 34 accidents, as compared with 87 last year and 74 two years ago.

TABLE II—ACCIDENT RECORD BY MONTHS, 1921-1924, EL PASO ELECTRIC RAILWAY

	1921	1922	1923	1924
January	152	164	101	73
February	133	144	98	62
March	163	162	98	47
April	177	119	98	41
May	173	150	116	39
June	147	105	89	47
July	147	109	49	55
August	122	84	63	49
September	128	89	56	48
October	120	74	87	34
November	141	98	69	..
December	164	103	98	..
	1767	1401	1022	*495

*Ten months.

The Readers' Forum

Comments on Report of Committee on Foreign Operation

MOUNT VERNON, N. Y., Dec. 1, 1924.

To the Editors:

It may seem rather late in the day for a discussion of some high lights in the report of the A.E.R.A. committee on foreign operation, but surely such discussion is warranted by the importance of the subject. The fact that this splendid report was the last feature of the last day of the 1924 convention was unfortunate. However, the publication of the report in itself has already proved of great value, notably with regard to the true status of the motor bus. Such a report was needed, for even its wide publication has not prevented repetition in the Detroit *Times* during November, 1924, of the well-worn fable that the bus has replaced the tramway in London!

The committee rightly stresses the difficulty of international exchange of good practices in full. Yet where there's a will, there's a way. We may reject the use of ticket inspectors to check over-riding, but we are accepting the differential fare principle of Europe just the same. San Diego is an early successful example; Public Service Railway, a later convert. On the other hand, although the manager of the Amsterdam Municipal Tramways was delighted with our safeties, he had no air compressors to permit electro-pneumatic control, but he did find a way to apply the same principles with electro-mechanical equipment.

The committee has done full justice to the fact that while the foreign tramcar is less comfortable and perhaps 10 per cent slower, it is cleaner, quieter, lighter and better maintained than our cars. Part of that quietness is due to a high standard of track upkeep. During a British visit directly after the war, almost every manager apologized for his track. Although I rode often on the upper decks of the cars, I certainly did not observe shocks, nosing or other defects severe enough to have elicited like apologies here.

FRANK TALK ON THE BUS

Those who read my studies on "The Place of the Bus" published during 1920 in the ELECTRIC RAILWAY JOURNAL will recall that the arguments for the coordinated use of bus and car were drawn almost entirely from British practice. American street railways then held bus operation in horror. But while the Britisher started first we have been moving so fast during the last two years that now he can learn from us in equipment, if not in applications. That is because we are both a richer and more hysterical people. The very railways that fought the bus most flopped the hardest once they were convinced.

The committee has used no gloves in handling the problem of buses for big-scale transport. Some extreme bus advocates may even feel a brass knuckle or two. Its outstanding statement is that "whatever street congestion there is . . . is caused almost entirely by motor buses and taxicabs."

It is a fine thing for the prospective rider to board a vehicle at the curb, but it does not speed up general vehicular movement if great, hulking double-deck buses are constantly cutting across the lines of faster automobile and truck traffic between the street center and the curb. If other traffic has no rights, why not build the car tracks alongside the curb?

The committee was told by Lord Ashfield, managing director of the Traffic Combine, that the present billion a year tram riders could be carried by buses "in the event that sufficient street space . . . were provided." He did not suggest that the motor bus should pay for said widening. On the other hand, the London County Council Tramways account in respect to "Cost of street improvements" shows that up to March 31, 1922, £809,295, or about $3,883,200, had been assessed against the street railway for such widening, exclusive of paving. Had the motor bus been saddled in this manner, there would have been little or no profit. Therefore, one of the big advantages of bus over tram in London is that it has enjoyed a subsidy out of the public funds via the street car rider.

The committee was impressed with the apparent recklessness of British riders in boarding or leaving cars and buses. Its comment that this nevertheless has not been reflected in damage claims is borne out by reports of these tramways for fiscal years ending in 1924: Bradford "accident insurance and compensations" account, 0.7 per cent of traffic revenue; same account Manchester, 0.6 per cent; Glasgow "third party accident" and "employers' liability" combined, 1.9 per cent. Glasgow's higher figure is due partly to its heavier traffic and possibly, also, to a provision that calls for trial of accident suits at Edinburgh.

With regard to the trackless trolley or "railless," the British have several special reasons for favoring it. First, the cost of energy is no higher if not lower than ours, but gasoline sells for 25 cents per American gallon against our range of 11 to 20 cents, with 15 cents preponderant; second, British cities operating tramways usually own the central station and don't want to lose trade; third, where the replacement of a trackway is concerned, it is much easier from a franchise viewpoint to replace with trackless trolley than seek motor-bus rights from Parliament. For all that, motor buses far outnumber trackless trolleys, as here.

In discussing Bradford, the committee notes that nearby towns were unwilling to have Bradford routes extended their way, and it thinks that "this was a rather interesting sidelight on municipal ownership." This feeling has nothing to do with municipal ownership, but is simply the fear of the little communities that such extension of the big communities' utilities is the first step in their political annihilation. This handicap has been foreseen in Detroit by a provision in the state charter which permits the Department of Street Railways to operate for 10 miles beyond its boundaries.

LESS CONGESTION OF POPULATION IN LONDON

The committee is not quite correct in stating that London is uniformly built up to four or five stories. The greater part of London's housing consists of small houses for one, two or three families, but many downtown areas and sections alongside of the main highways seen by the chance visitor are of the apartment type. The facts are revealed by the statistics on population per acre. In 1920, inner London had 60 inhabitants and inner New York (Manhattan Borough) 123 inhabitants per acre. Greater London had only 17 per acre, while all New York had 28 per acre. The center of flat-fare New York is 125 per cent more densely settled than the center of zone-fare London, while New York as a whole is 65 per cent more densely settled than London.

The committee's adventures on the most heavily traveled city routes in the world led it to include that one-man operation is "virtually impossible" with zone fares. These are strong words when we consider that there are already in use a number of distance-fare routes in America and Europe with one-man cars or buses. It is true that many are light cross-country lines, but San Diego with two zones in the city and more on the suburban extensions has already advanced from one-man single-truck to one-man double-truck cars.

Again, of the 35 managers who answered a questionnaire of the International Street & Interurban Railway Association, 14 did consider operation of one-man cars practicable under zone fares and 12 more agreed it was all right for light lines anyway.

There are many two, three and more zone properties abroad where one-man operation will be feasible if the managements can find the money for automatic appliances, wider platforms, vestibules, fare boxes, ticket-issuing machines and other Americanisms, although it may never be possible to carry such operation to the same degree as under a single fare.

The mystery of "Why do the British keep double-decking?" brought no more satisfactory reply than that they have always done so. America used to double-deck in a small way in horse-car times, but today there are less than ten double-deckers in all. Continental Europe has practically discarded double-deck cars, yet Berlin and Vienna have double-deck buses. Paris, which had double-deck buses in horse days, has since standardized on single-deckers, although the bus is not yet capable of using a trailer to secure increase of unit capacity.

Double-Deck Cars Losing Caste

But at recent British conventions there have been rumblings against continuing the double-deck car, which necessarily must run at a lower schedule speed than single-deckers owing to greater standing time and high center of gravity. London no longer attaches single-deck trailers to double-deck motor cars because the County Council Tramways are out for greater speed through use of interpole motors and other improvements. Before the war, speed did not bother operators because there were almost no standing loads. Post-war conditions brought the 8-hour day, which piles up the peaks very sharply. No later than September, 1924, General Manager Wilkinson testified, in arguing against a cut in workmen's fares at Bradford, that 37 per cent of the total load was carried between 8 a.m. and 9 a.m. Formerly, the laborer was on the cars at 6 or 7 a.m. Now one of the most common fare petitions is for the privilege of having the workmen's half fares apply as late as 8 a.m. or 8:30 a.m. The committee's reference to the new Edinburgh cars is proof that this approach to American loading is bringing American ideas of passenger interchange, viz., separate doors for entrance and exit.

The committee may not have had the doubtful pleasure of riding the Paris solid-tire single-deck buses over the cobbled by-ways of that wonderful city. The Paris company may think pneumatics still an experiment, but the Michelin Tire Company is of another opinion. In a recent advertisement, headed, "Parisians—A Scandal," Michelin presents this deadly parallel: On the left, pigs ride softly to slaughter on pneumatic-tired trucks; on the right, the worthy fare-paying Parisians are being jounced on hard-tired buses.

With increased familiarity, the public is as critical of bus equipment as of the longer known trolley. It wants no slat seats in cars or hard tires under buses. The 15,000,000 soft-cushioned automobiles of America have set a high standard for vehicle comfort, no matter what the rate of fare.

As to gas-electric buses, it was my privilege to study in great detail the costs and operations of the Birmingham & Midland Motor Omnibus Company, which operates some 250 of these buses as standard. Comparison with the straight gasoline buses of other companies in the same syndicate did not disclose any marked economy in fuel and upkeep, but it was obvious that the gas-electric bus was easier to ride and far less noisy.

Supplementing the committee's notes on "Noise of Operation," be it noted that the Amsterdam and Malmö tramways have done something on their one-man cars worth copying the world over on any kind of car or bus. They have substituted passenger stop-lights for the noisy bell or irritating buzzer. How much more pleasant a ride would be if signal and register noises could be eliminated forever.

Proportions of Short-Haul Riders

Under the heading "Kinds and Rates of Fare" the committee notes that in Britain the one-zone riders tend to make up 35 to 50 per cent of the total traffic. It is not entirely correct to assume that "this reflects the closely built-up nature of most of the European cities" because like percentages occur in widespread cities like San Diego; Melbourne and Adelaide in Australia and Christchurch, New Zealand.

In San Diego, with only 2.5 inhabitants per acre of all its area and but 13 per acre on built-up ground, the number of one-zone and two-zone riders is almost exactly the same. In this case, the inner zone rider averages 1.3 miles per ride and the outer zone rider about 3 miles.

At Melbourne the cable system operating in the older section carried only 31 per cent at the minimum fare of 1.5d., whereas the electric system operating in the suburban areas carried 47 per cent at the minimum fare during the year ended June 30, 1923. Although Adelaide fares go to 12d., the average of 2.5d. indicates a very high ratio of short-haul riders. The Christchurch report for the year ended March 31, 1923, shows that more than 60 per cent of the traffic was at the minimum adult fare of 2d. or 4 cents.

These figures show that the proportions of rides at different rates of fare are affected just as much by the scale adopted as by the distribution of population. Through juggling the rates you can get anything you want.

Since the committee's table showing average bus and tram rides for given fares had to omit the London bus, it is worth adding that London bus fares vary by 30 per cent just according to the presence or absence of tramway competition, and that they include no workmen's rates. As the buses have a much higher seat-use factor than the trams, they naturally do not favor any off-peak reductions such as the "tuppeny all-the-way" concession of the London County Council Tramways. The gains from this concession, as mentioned in the report, refer of course only to the tramway business of the mid-day hours. In the fiscal year ended March 31, 1924, 28 per cent of the passengers rode at mid-day rates and 13.75 per cent at workmen's rates.

The British zone fare is found in many varieties. Glasgow and Leeds tend to work toward the same average length of ride for each increment in fare. Manchester seeks to give the longest possible ride for the

minimum fare figuring from the downtown center. The London Underground fares, like American steam railroad commutation, give more and more per penny the farther one rides. No one dreams of rigidly interpreting the legal limits of 1.5d. or 2d. per mile. These may be the average rates per mile, but the stages themselves are never laid out in geographical miles. They are laid out chiefly according to traffic intersections and may vary greatly not only on the system as a whole, but on individual portions of the same route.

In connection with fares, the report remarks briefly that the actual wages in Europe generally are but one-third to one-half of ours. The state of the continental coinages makes a comparison impossible for all European countries except Britain. As regards Britain, it would be more correct to say one-half to two-thirds. The comparison cannot be made on the basis of hourly rates or even weekly earnings because the men receive uniforms and overcoats free, vacations with pay for a week or more, longer time allowances, higher overtime rates, etc. It is true that British platform men do not live so well as ours, but this is also due in part to the fact that luxuries cost more, whether movies or flivvers. The platform man's standard week is 6 days, totaling 48 hours.

The committee correctly assumes that there is loss from over-riding under the zone fare prevalent abroad. There is also a loss due to the fact that a passenger on a loaded double-decker may have already ridden a stage before the conductor gets around to him. However, these losses are not inherent to the zone-fare system. If the passenger had to give up his receipt upon departure instead of throwing it away where he pleased, there would be no more over-riding than on our own distance-fare routes. The use of closed prepayment areas or of street collectors at heavy boarding points would also minimize the second kind of loss mentioned. One of the crying needs of the busy British tramway has been a car that will permit entrance on one platform and exit on the other. The double-deck design is largely to blame because the stairways leave so little room on the platforms.

THE WEEKLY PASS AT HULL AND BRADFORD

Last, but not least to me, is the final paragraph in the report giving some of the experiences with the weekly pass at Bradford, also used at Doncaster and Hull. There is some humor in the fact that the weekly pass, derived from the foreign season ticket, should return to its home clothed with transferability and a 7-day period instead of 3 months or so. When A. H. Wilkinson, general manager, requested counsel in the matter, I suggested the pass as a means of speeding up fare collection and of putting off the then threatened reduction of the base fare from 1.5d. to 1d. If it did not make money, you will observe that the report states it has been saving money at the rate of £95,000 a year. It was not expected that the pass would have much sale among workmen because the latter get a lower rate anyway and have less money for off-peak diversion, but the sales actually have been much higher than I expected because some of the better-paid riders have given up their workmen's rates in favor of the pass.

WALTER JACKSON.

Association News & Discussions

Features of Second Convention of Central European Street Railways

At the September Meeting of the International Street and Interurban Railway Association Many Features of Equipment and Track Design, Maintenance Methods, Fares and Employment Problems Are Discussed

THE second convention of the Internationaler Strassenbahn und Kleinbahn Verein (International Street and Interurban Railway Association) opened at Homburg von der Höhe on Sept. 3-5, 1924. This organization of central and northern European electric railways was founded in 1920 at Nürnberg and its first big meeting was held in Vienna in 1921. In opening the 1924 sessions, President Ludwig Spängler, general manager Vienna Municipal Tramways, noted that the 1923 meeting scheduled for Budapest had been postponed because of the continuance of unsettled economic conditions. He was sure that the participation of 330 delegates and 100 women visitors presaged better times. The association has now more than 400 members.

A paper on one-man cars was presented by Messrs. van Putten and Hultman, respectively general managers of the Amsterdam and Malmö systems. This was abstracted in this paper for Nov. 28, page 926. In Europe, the dominant desire for such cars was saving in labor cost by bringing wages to say 36 per cent of the revenue or 41 per cent of the operating expenses. Twenty-five systems were operating one-man cars and 14 more contemplated doing so.

General Manager Geiser of the Schaffhausen Tramways discussed the growing competition due to cross-country automotive lines. In 1907, Switzerland had only 3,837 motor vehicles; now there were 40,116. Regulation of this rapidly growing means of transport was certainly in order. The Swiss railways have therefore demanded of the government that (1) railway regulation should be moderated; (2) special rebates for mail carriage should be eliminated; (3) tariff on rails and special work should be removed; (4) taxes should be imposed on automotive transport to pay for their use of the highways; (5) general service and tariff regulations covering automotive transport, including restricting the over-all weight of vehicle to 5 metric tons (11,020 lb.) should be enacted. The speaker recommended that the railways take up and co-ordinate motor transport with rail transport.

General Manager Norregaard, Copenhagen, followed with his paper on the efficiency of transportation personnel as judged by mileage output, placing stress on the need for separating city and cross-country roads in making comparisons of relative net speeds, etc. This was abstracted in the issue of this paper for Nov. 1, page 775.

Alexander Patz, acting general manager Budapest Tramways, then discussed methods for securing better spacing of cars; and also means for judging the relative efficiency of the different depots from both transportation and maintenance viewpoints. (See ELECTRIC RAILWAY JOURNAL for Nov. 15, page 856.)

ANTI-FRICTION BEARINGS—TRACK

Two papers were to have been presented on anti-friction bearings. Dr. Vidéky, Budapest, based his paper

largely upon a discussion of design, classification and material. However, General Manager Pforte of the Hagen Tramways refrained from presenting replies to the questionnaire for discussion because the answers had been given for the postponed congress of 1923 and they therefore no longer gave a fair picture of progress. (Abstracted in the issue of this paper for Nov. 1, page 774.) General Manager Hubrich, Essen Tramways, who spoke for Mr. Pforte, stressed the importance of more exact tests, such as having different cars run to their coasting limit with and without anti-friction bearings—aside from the use of watt-hour meters. It was resolved to continue the questionnaire as a feature for the next convention.

Chief Way Engineer Goetz, Leipzig, followed with his paper on track and its upkeep. (Abstracted in the issue for Nov. 15, page 854.) At his suggestion the meeting adopted resolutions calling for fewer curves with longer radii, for preferential specification of standard rail sections and for the elimination of concrete sub-structure in favor of well-drained broken stone foundations accompanied by welding of all joints.

General Manager Hausmann, Coblenz, presented an interim paper on standardization of grooved rails in three classes, viz.:

DIMENSIONS OF PROPOSED STANDARD RAILS FOR CENTRAL EUROPEAN TRAMWAYS

Section Number	1	2	3
Height, mm.	180	180	160
Base, mm.	180	160	160
Tread, mm.	56	50	48
Width of groove, mm.:			
Tangent track	31	31	31
In curves	34	34	34

The standardization study is to be continued by the Technical Commission of the Verbandes schweizerischer Secundärbahnen (Swiss Secondary Railways Association), of which Dr. Zehnder, general manager Montreux-Oberland Railway, is chairman.

Magnetic Brakes—Power-Checking Plans—Self-Ventilated Motors

The second business session, held on Sept. 5, opened with the paper on magnetic brakes by General Manager Barth, Christiania (issue of Nov. 15, page 855). He was followed by General Manager Pforr of Berlin, who discussed current saving without the use of checking devices (issue of Nov. 1, page 776).

The paper on self-ventilated motors by Mr. Nier, engineer of the Dresden system (abstracted in the issue of Nov. 15, page 854) was discussed by Dr. Zehnder of Montreux, Switzerland. Ventilated motors had made good on his line, which is 76 km. (47.1 miles) long, meter gage (39.37 in.) and in difficult country. On other narrow-gage lines there were difficulties in drawing air directly from the trackway, so that car-body or roof intakes were preferable in such cases. The temperature difference of ventilated and closed motors increased with the increase in stop spacing. With stops only 180 m. (590 ft.) apart, there was no difference, while for long runs the difference might be in the ratio 2: 3.

Mr. Paap, retired government engineering councilor, Berlin, then gave a talk on couplings.

August Winter, executive staff Vienna Municipal Tramways, in presenting his paper on fares in municipal areas (issue of Nov. 29, page 924), observed that the proportion of weekly wages which a workman paid for a single fare, averaged as follows:

Scandinavia	0.0020 to 0.0025
Holland	0.0024 to 0.0029
Switzerland	0.0015 to 0.0023
Austro-Hungarian succession states	0.0030 to 0.0038

The total annual expenditure for carfare may reach a sum equivalent to four weeks' wages.

The meeting closed with a demonstration lecture on wireless telephony and radio by Prof. Leithäuser, Berlin, and the possibilities it offered in railway service for communication with moving vehicles, using rails, wire and vehicles as part of the transmission system.

Next Meeting at Budapest

The association decided to hold its next convention at Budapest in June, 1925.

At a suggestion made by General Manager Ruijs, Enschede, it was planned to ask the Union Internationale de Tramways, de Chemins de fer d'Intérêt local et de Transports Publics Automobiles to use its good offices to intercede for German street railway managers who had been exiled in the course of the military occupation.

Tramway Men Attend Colorado Utilities Convention

ABOUT 100 delegates, including many electric railway men, from Colorado, Wyoming and New Mexico, attended the second annual mid-winter conference of the Colorado Public Service Association and the Rocky Mountain Division of the National Electric Light Association held in Denver on Dec. 18.

E. A. West, general superintendent and chief engineer Denver Tramway, who was one of the principal speakers, pointed out that in regulating the traffic on the streets of the cities, insufficient attention is given to the tramway, whereas it should be one of the principal things to consider when planning new regulations.

A.E.S.C. to Hold Conference on Line Materials

A CONFERENCE has been called by the American Engineering Standards Committee as the result of proposals for the standardization of overhead line materials made by the American Electric Railway Association. This will be held at the Engineering Societies Building, New York City, on Jan. 13, 1925, beginning at 10 a.m. The purpose of the conference is to determine whether the unification and extension of specifications for overhead line material, such as pole line hardware, cross-arms and pins and strain insulators shall be undertaken.

At the conference the present situation in regard to specifications for overhead line material and the suggestion of general policies as a basis of discussion will be presented by M. B. Rosevear. The question will be taken up as to whether there are any overhead line materials for which specifications should be unified, and if so, whether it is desirable that the unification shall for the present be limited to materials used by two or more branches of industry or whether specialized materials for specialized industries should be included. The inclusion of materials and dimensional data, and nomenclature will also be discussed.

Work on the following subjects is already in the hands of representative sectional committees under A.E.S.C. procedure: Wood poles; tubular steel poles; conductors; insulated wires and cables; annealed, medium and hard-drawn copper wire; zinc coating of iron and steel.

Kentucky Utility Meeting

THE annual meeting of the Kentucky Association of Public Utilities will be held at Louisville, Jan. 15 and 16, 1925. About 300 public utility executives from Kentucky and surrounding states are expected at the meeting.

Convention rates of one and one-half times regular one-way fare have been arranged for by the Southeastern Passenger Association and the Central Passenger Association. These rates apply on all tickets costing 67 cents or more one way. The selling dates are Jan. 12 to 16 inclusive, and the last honoring date, Jan. 20.

American Association News

Subjects and Meetings

THE committee on subjects and meetings met in New York Dec. 19 for the purpose of more definitely drawing up the program for the Midyear Meeting of the association to be held in Washington on Feb. 17. As tentatively outlined, in addition to certain outstanding speakers, the program during a portion of both the morning and afternoon sessions is to take the character of an old fashioned "town meeting." In the morning the discussion will be somewhat in the nature of checking up of the electric railway business with comments from the point of view of the manufacturer, car rider and railway. In the afternoon the subject of when, where and how to use buses will be discussed from the point of view of manufacturers and railways. The committee also determined upon the speakers to be invited for the two business sessions and the banquet in the evening.

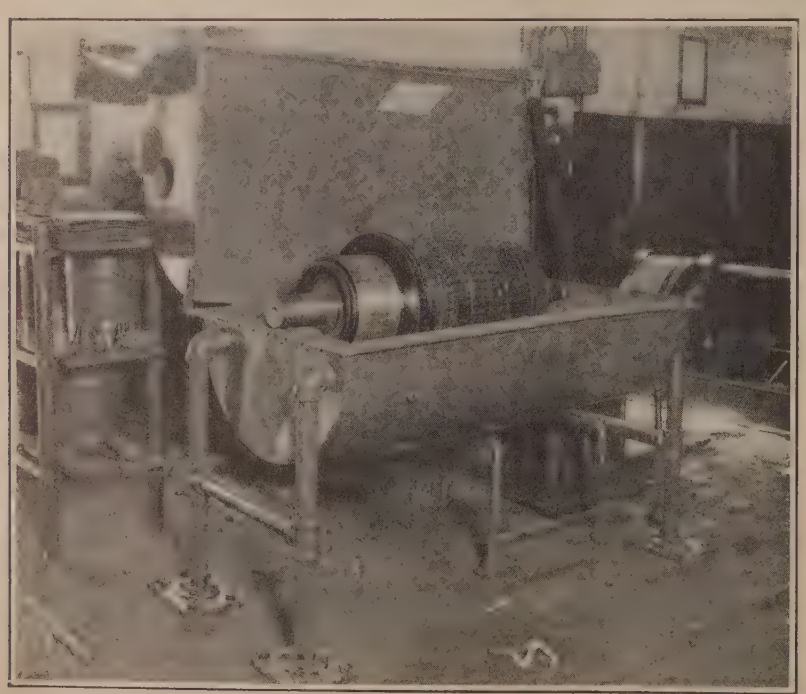
Members of the committee present were Chairman W. H. Sawyer, H. D. Briggs, Harry L. Brown, Charles H. Clark, F. W. Doolittle, C. R. Ellicott, C. W. Kellogg, E. F. Wickwire and J. H. Hanna.

Maintenance of Equipment

Efficient Method of Cleaning Armatures

THE usual method of removing loose dirt and dust from armatures when they are removed for overhauling is to direct a spray of compressed air on the equipment. To blow off the dirt efficiently, and at the same time to prevent dust from flying off during the process, inconveniencing adjacent workmen, the equipment shown in the accompanying illustration is used in the 39th Street shops of the New York Rapid Transit Corporation, Brooklyn, N. Y. It consists of a sheet-steel drum whose upper section is hinged so as to permit the insertion of the armature. The armature is supported on two sets of rollers, so that it can be rotated easily. The end brackets are arranged so that the weight of the armature is carried directly by the 1½-in. pipe framework on which the drum is mounted.

With an armature in position the top is closed down and compressed air is turned on through two pipes passing into the bottom of the drum. At the back of the lower section is a 4-in. exhaust pipe. An exhaust blower in this line draws off the dust as it is blown from the armature and the dirt is carried to a receptacle on the outside of the shop. The armature can be rotated by a workman inserting his hand through a hand hole in the end of the upper section of the drum. By the use of this equipment armatures are cleaned efficiently and all dirt is confined so that it does not fly off in the shop and interfere with other work.



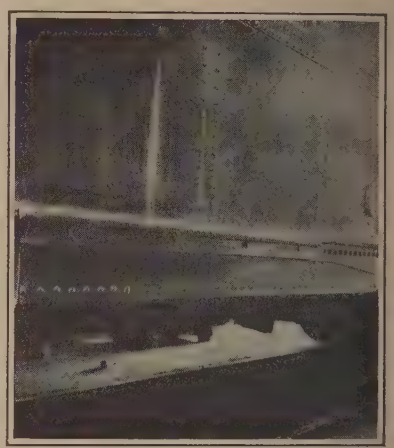
This Cleaning Drum for Armatures Has a Suction Attachment for Removing the Dirt

Fiber Covered Rods for Brush Holders

AS THE result of trouble which had been experienced with metallic bracket arms on brush holders, the Eastern Massachusetts Street Railway is replacing these parts with fiber-covered metal rods. The appearance of the modified brush holder is substantially the same as before, as is shown in the accompanying illustration. It has been the experience of the railway since undertaking this change that there have been fewer short circuits. Ordinary fiber tubing is used to cover the metal rod.

Counteracting Corrosive Effect of Acids

DIFFICULTY has been experienced by the Boston Elevated Railway on account of damage to the exterior paint of its new rapid transit cars operated through the East Boston Tunnel. This tunnel was built many years ago and has always been somewhat leaky. Salt water seeps through and drops down on the roofs of the cars. From there it runs down the sides, checking the varnish, eating the paint, and corroding the metal. The nature of the defacement caused in this way is shown in an accompanying illustration. The company is using Wilson's Imperial Paint Restorer to counteract the corrosive effect of the salt water.

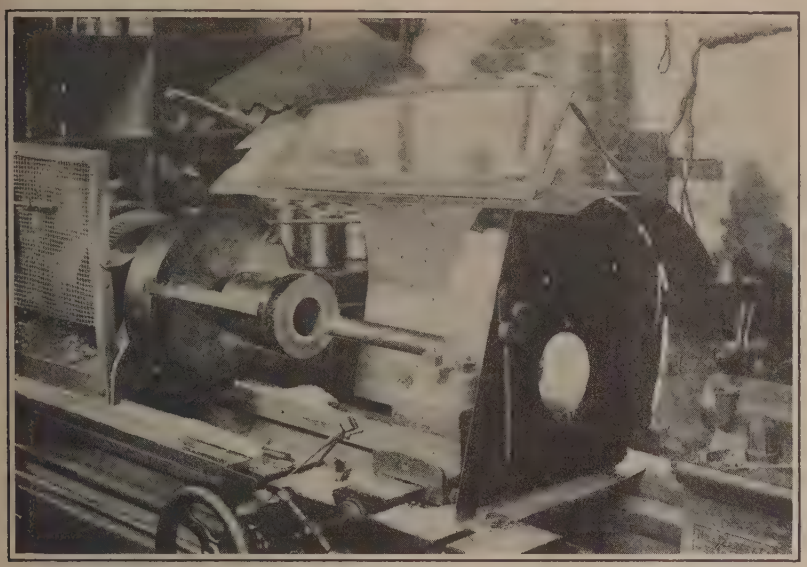


Defacement of East Boston Tunnel Cars Caused by Salt Water Dropping on Roof and Running Down the Side

Self-Centering Chuck Facilitates Bearing Machining

By W. L. Briar
Foreman Kansas City Railways

IN THE shops of the Kansas City Railways bearings are bored in a self-centering chuck having special long jaws that grip the bearing securely and hold it firmly in place during the operation. This chuck is manufactured by the Union Manufacturing Company and is known as No. 153 Class D.



A Special Long Jaw Type of Self-Centering Chuck Facilitates the Work of Machining and Boring Bearings. Complete Protection to Workmen Is Afforded by the Almost Totally Inclosed Housing that Is Set Up Around the Work

Although the bearing turning and boring operations are usually carried out in a large Gisholt lathe, the work may also be done efficiently in an ordinary engine lathe with the set-up shown in the accompanying illustration. In this case the boring bar is held in a special clamp on the tool post, and is readily fed into the work. For boring babbitted bearings to final size for fitting to worn shafts, this set-up is particularly useful since it avoids tying up the Gisholt lathe for this work.

Another interesting feature of the bearing finishing work as it is carried out in the Kansas City shop is the complete guard that is built around the work, for the purpose of conserving scrap brass and babbit and also to protect the operator and adjacent workman from flying bits of brass. It will be noted that a hinged brass shield on the front of the guard is arranged so that it can be lowered into a position that completely protects the workman's eyes, and at the same time allows him clearly to see the work in progress. An additional flexible flap on the bottom of the shield helps to confine the scrap brass to the pan provided for its collection.

High-Speed Saw Makes Saving

A SHORT time ago the Altoona & Logan Valley Electric Railway, Altoona, Pa., replaced its old power-driven hacksaw by a Peerless high-speed saw. This change in the shop equipment has effected important savings in two ways. A great deal of time has been saved, and the labor cost thereby much reduced. It now takes only 15 minutes to cut a 5-in. axle instead of 2½ hours, which was required formerly. Moreover, the number of blades required has been much diminished. Whereas it used to require four or five blades to cut an axle, now one blade will do several jobs of this kind.

In addition to the ordinary work of the mechanical department, rails are cut for the track department. The greater speed of operation of the new saw has saved money for the company by eliminating much of the waiting time of track men while this work is being done.

This Saw Does a Job in 15 Minutes that Formerly Required 2½ Hours

New Equipment Available

Electric Hoist

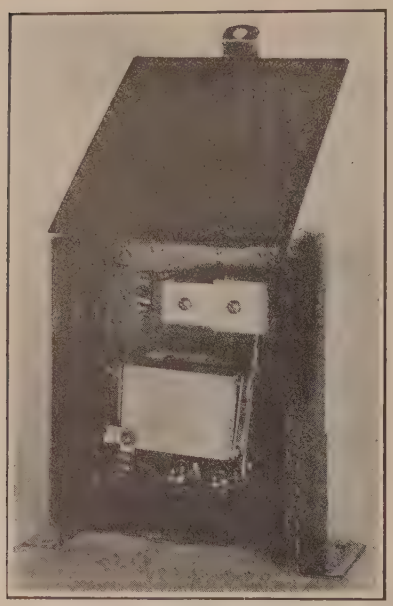
A NEW electric hoist designated as type R and available in capacities from 500 lb. to 4,000 lb. has been recently added to the line of the Roeper Crane & Hoist Works, Inc., Reading, Pa. The hoist is worm geared, the worm being placed above the gear to reduce wear. The worm shaft is equipped with end-thrust ball bearings. The motor is mounted directly upon an extension of the hoist frame. This is a one-piece casting that contains all bearings so that shaft and moving parts are kept in alignment. An automatic stop provides top and bottom limits. Controllers are of the single-speed drum type, although push-button control can also be furnished. The moving parts of the hoist are entirely inclosed and operate in a bath of heavy grease or oil.

Improvements in Signal Light System

THE signal light system, as ordinarily used by electric railways, provides a visible indication for the motorman or operator to show when all doors are closed. Additional features incorporated provide that the doors cannot be opened until the car is stopped and that the car cannot be started until the doors are fully closed. A number of improvements in the various detail parts which constitute the signal light system have been made recently by the Consolidated Car Heating Company, Albany, N. Y.

The latest door switch, Type 397, which breaks and completes the signal light circuit as the doors open and close, has contacts thrown in or out by a toggle mechanism. The brass rollers now used for the movable contacts provide a wiping action as the contact is made, which eliminates trouble due to dirt or dust. A bakelite insulated base supports the movable contacts. The rear of this base is provided with two recesses for the springs which hold the switch in one or the other of its two positions. The contact studs are also imbedded in a bakelite base.

Where the control is interlocked with the doors in addition to provid-



The Type 700 Control Relay Has Magnet Coil in Series with Signal Light Equipment

ing a door closing signal, the Type 398 door switch is used. This has double sets of contacts, one set for the signal light circuit and the other for the interlocking control circuit. This type of switch is also used for making contact where variable load brake equipment is used. The box which houses the mechanism is of cast iron, about 4 in. square, and has a sheet metal cover. Contact is made by means of a copper disk with molded insulation on either side. The plunger which operates the contact disk has two springs, one for holding it out and the second for providing pressure on the disk. The new form of contact base is of bakelite canvas, with brass contacts. This type of switch can be arranged for operation either by the door itself or by the arm of the door engine.

The new motorman's starting signal light is smaller and neater than the previous design. It has a conduit mounting and a porcelain base for the lamps and contacts. As in the older type, two signal lamps are connected in parallel, but a resistance is in series with one of them, which prevents the lamp with which it is in circuit from lighting normally. When the right hand lamp fails the one at the left lights automatically without the mechanical action of any moving parts. When the burned out lamp is replaced it again gives the signal light as before. The resistor is mounted surrounding the porcelain base of the spare lamp, making the unit very neat and compact. Bayonet type lamps are used, as it has been found that these do not work loose through vibration.

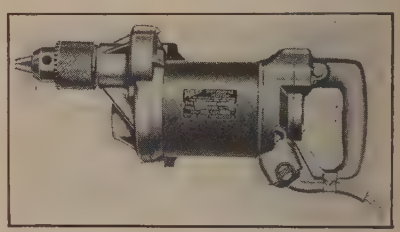
Some improvements have also been made in the Type 700 control relay, the magnet coil of which is connected in series with the signal light equipment. Compression springs are now used to open the circuit when the coil is de-energized. When all doors are closed, the magnet coil is energized and the relay contacts are closed. These contacts being in series with the magnet coil of the main line switch or contactors in the control circuit the car cannot be started until all doors are closed.

Elevating Platform Truck

AN ELEVATING platform truck which has a height of 17½ in. from the floor when the platform is down and 22 in. when the platform is raised has been placed on the market by the Crescent Truck Company, Lebanon, Pa. The rear wheels have a diameter of 15 in., which gives 6 in. clearance underneath the platform. All the tires are 5 in. wide and the truck has been designed throughout for heavy service, with a lifting capacity of 6,000 lb. The wheels are equipped with Timken roller bearings, the driving unit is carried on SKF ball bearings, the controller is built by the Cutler-Hammer Manufacturing Company and the motors are of General Electric manufacture. All working parts are accessible and readily adjustable. The loading platform is 70 in. long and 26 in. wide.

Low Speed Electric Hand Drill

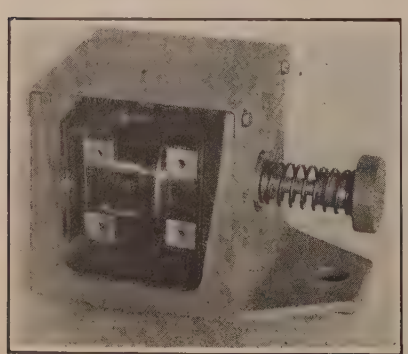
THERE are some materials, including slate and marble, which can only be drilled at a very low speed. To provide for this class of work the Hisey-Wolf Machine Company, Cincinnati, Ohio, has recently brought out a low speed electric drill. This operates at a no-load speed of 110 r.p.m. and has sufficient



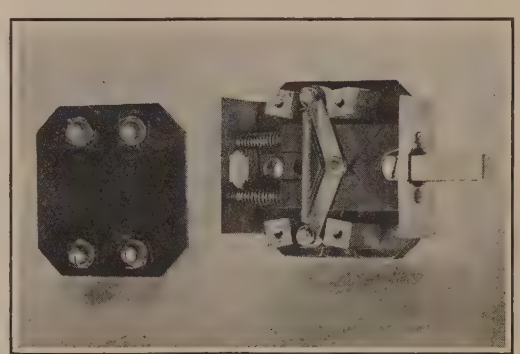
An Electric Drill that Runs at 110 R.P.M.

power for drilling holes up to ½ in. diameter. This drill is equipped with a universal motor which can be operated on either alternating or direct current. Ball bearings are provided throughout. A new feature is a quick cable connector, which permits cable repairs and renewals without dismantling the machine.

For drilling slate and marble the manufacturers recommend ordinary carbon steel twist drill ground with a straight chisel face. A drill ground straight across with the cutting edge at right angles with the sides will bore true to size. By grinding the cutting edge on a slant the drilling size of any bit can be increased, depending on the slant or angle at which it is ground.



At left, Type 398 switch interlocks control with doors in addition to signal lights.



Improved Apparatus for Car Signal Circuits

In center, switch used for door control of signal lights.

At right, signal light to indicate to motorman when all doors are closed.

The News of the Industry

Mayor Hylan a Witness

Presiding Justice Has to Remind Auditors that Hearing Is Not a Show —Delaney Questioned

Mayor Hylan was the star witness of the week at the transit inquiry being conducted in New York as a result of charges filed with the Governor by the Mayor himself. A statement had been prepared by the Mayor in advance, but he was refused permission to read it. The statement, published in full by some of the newspapers, ran to the extent of a full newspaper page. Justice McAvoy said it could not go into the record unless presented under oath, but he would give the Mayor's brief consideration when he came to write his report.

Counsel for Justice McAvoy, who is to the subject of the questions. Most of the time the spectators were tittering. There were frequent raps of the gavel to restore order. At one point Justice McAvoy said:

This is not a show, gentlemen. It is an endeavor to find out what the trouble is with the various situations confronting the transit authorities.

Here are some samples of the Hylan sallies:

You don't have to be a transit engineer to have just ordinary common sense.

I wouldn't take up anything with McAneny (chairman of the New York Transit Commission). Not on your life. I don't trust him.

I have ridden on the subways and the elevated lines, and for many years I was a locomotive engineer and know something about service.

I am not going to let you lead me into a trap.

I am not an investigator. I am just endowed with ordinary common sense that God Almighty gave me. We are entitled to better service on the existing lines and until the end of my office I am going to fight for better service.

I am made the defendant instead of the prosecuting witness.

Mr. Sherman finally brought from the Mayor that the city's position regarding improvements in service had been presented to the commission "in a general way."

Mr. Sherman persisted in asking whether the Mayor had consulted any engineer in regard to how service might be improved and the Mayor finally said he had consulted Frank J. Sinnott, secretary of the Board of Transportation and brother of the Mayor's secretary and son-in-law, John F. Sinnott. The Mayor presented a memorandum, prepared by Mr. Sinnott, as to how service on existing lines might be increased.

Examination of the Mayor showed that this memorandum had been prepared very recently. The Mayor declared that he had done everything he could think of to compel "McAneny and the State Transit Commission" to give better service on the existing lines.

Certainly the hearing was productive of little that was constructive. The Mayor's brief, however, made plain the fact that he stands for these things:

Construction of new independent subway system to be operated at a 5-cent fare.

Establishment of an adequate motor bus service.

Proper service on existing subway, elevated and surface lines.

Advocacy of passage by Legislature of proposed constitutional amendment to exempt from the city's debt limit the $275,000,000 expended in the original subway as self-sustaining, and use of the credit that might be thus released in the future to borrow money to help pay the cost of the proposed independent subway system.

No connection of new subways with either the present B.-M. T. or Interborough system, and no perpetuation in that way of what the Mayor calls "a bad business bargain for the city" in the dual subway contracts.

Condemnation of and promise of continued opposition to the Transit Commission's plan for the reorganization of the transit companies of the city into a unified system, which the Mayor characterizes as "a scheme to loot the public" by making the riding public pay for lines "about to be scrapped."

The two previous days John H. Delaney, chairman of the Board of Transportation and Mayor Hylan's chief adviser in transit matters, was on the stand. Mr. Sherman's questions were directed particularly toward bringing out the salient points of the connection of Mr. Delaney with transit matters, first as transit construction commissioner, later as adviser to Mayor Hylan and more recently as head of the city Board of Transportation under the Mayor. Mr. Delaney simply would not permit himself to be jockeyed into a position of criticism with respect to saying anything that might be interpreted as a direct reflection upon the Mayor. He said:

The Mayor makes so many statements I can't keep track of them all. Please do not ask me to comment on the Mayor's action. He was free to do as he chose, and as he is able to speak for himself, I do not want to criticise any one.

Bitter Words Over Cleveland Bus Proposal

Ohio Commission Hears Objections to and Arguments for Bus Lines to Compete With Cleveland Railway—Expert for Bus Applicant Severely Grilled—Manufacturer Denies Connection With Applicants

HEARINGS have been conducted during the last two weeks before the Ohio State Public Utilities Commission at Columbus on the application of the People's Motor Bus Corporation, Cleveland, for a certificate of convenience and necessity to operate buses in Cleveland. The application was opposed by representatives of the city of Cleveland, the Cleveland Railway, the Cleveland Chamber of Commerce and other civic and commercial organizations. All these interests took the position that if buses are to be operated in Cleveland they should be run by the Cleveland Railway. The Clevelanders also contend that under the home rule provision of the state constitution the right to grant permission for bus operation in Cleveland lies with the City Council rather than the State Utilities Commission.

Two years ago, however, the State Legislature passed the so-called Collister-Freeman law, which gives the State Utilities Commission control over bus applications. The commission contends that under this act it has the right to grant permission to bus operators in Cleveland. Cases now pending in the State Supreme Court, however, may determine whether the state commissions or city councils have the right to control bus operation within municipalities.

Representatives of the city, including City Manager W. R. Hopkins, Mayor Clayton C. Townes and members of the utilities committee of the City Council, are attending the hearings in Columbus opposing the application of the People's Motor Bus Corporation. They claim that if a company other than the Cleveland Railway is allowed to operate buses in Cleveland, it will mean financial ruin for the Cleveland Railway.

Joseph L. Rhinock, Cincinnati, and E. F. Sims, St. Louis, are the principal backers of the People's Motor Bus Corporation. They were represented at the hearings by Attorneys John Campbell, Cincinnati, and R. W. Sanborn, Cleveland. Messrs. Rhinock and Sims were also the backers of the People's Motor Bus Company, St. Louis.

Henry M. Brinckerhoff, New York, appeared as an expert witness for the Cleveland People's Motor Bus Corporation. He was subjected to a severe cross-examination by Attorneys Harry J. Crawford and City Councilman Fielder Sanders, former city street railway commissioner.

The Cleveland *Plain Dealer's* staff correspondent, W. M. Tugman, tells of this cross-examination partially this way:

Challenging the reliability of the engineer, Mr. Crawford defied him, in the light of past statements recommending unified management and control of urban transportation facilities, to answer this question: "Is there any public convenience to be served by the granting of a license for bus operation in Cleveland to the Cleveland People's Motor Bus Corporation?"

Opposing counsel objected, and the commissioners ruled that this question as stated was one which they would answer in their own way in due time. Mr. Crawford made the question the general one of a permit to any competing company.

"I want the answer, 'Yes or No.'" he said.

"Object! Object!"

The commission ruled the witness should answer in his own way.

"You have two questions," said Mr. Brinckerhoff. "I have said I believe buses would supply a convenience the street railways do not now supply. The rest is a matter for the city and this commission to determine."

There was turmoil as Mr. Crawford demanded the answer be stricken out.

"Should a license be granted to any competing company? I don't care to whom, I want your opinion, as the expert of the $36,000 report."

"On which we made nothing," retorted Mr. Brinckerhoff.

"Perhaps it was worth nothing."

Followed a bitter argument in which Mr. Crawford pleaded with the commission to compel Mr. Brinckerhoff to give him a specific answer.

"This man doesn't dare to answer my question," said Mr. Crawford. "In view of his reports he's got to say that two competing systems would be ruinous. He's got to admit that if we let this concern in we sooner or later will have to buy them out at 100 per cent profit."

The commissioners said they didn't think the witness should be unnecessarily embarrassed. Mr. Crawford said he thought the importance of the situation demanded a stretch of the usual decorum.

"If this man says 'yes,'" shouted Mr. Crawford, "I'll hang him on his own reports. If he says 'no' he ruins his previous testimony. I don't care which he does, but I do want to know how far he'll stultify himself because his credibility is in question."

"Overruled."

Mr. Crawford went back to his questions from Mr. Brinckerhoff's past recommendations on unification of service and reshaped his question to read:

"Do you know of any reason why buses should not also be included in unification of service which you say you still advocate for rail systems?"

Again and again and again he thundered the question in a dozen different forms, the witness declaring that a multitude of circumstances made positive expressions impossible.

"Let's turn back to the high-priced report," said Mr. Crawford. "In 1919 you said: 'Unification of all transportation systems cannot be too strongly urged.' Do you stand by that now?"

"Yes."

"Do you know any reasons why bus operations should be excluded from that recommendation?"

"No."

YELLOW COACH MAKES STATEMENT

It has been talked around Cleveland that the Yellow Coach Manufacturing Company was behind the People's Motor Bus Corporation. This was denied in a telegram to J. J. Stanley, president Cleveland Railway, by John Hertz, chairman of the board of the Yellow Coach Manufacturing Company, Chicago, as follows:

I should like to have the Public Service Commission of Ohio, the city authorities, the press, the citizens of Cleveland and your good self and associates understand that neither I personally nor anyone associated with me in the various enterprises which I have the honor to represent is in any manner morally or financially identified with or interested in the activities of Messrs. Rhinock and Simms in their present efforts in Cleveland to procure the necessary legal rights for the installation of a motor coach service. On the contrary, we are wholly out of sympathy with what they are attempting to do there and I sincerely regret and resent the inference which apparently they permitted to get abroad without emphatic denial that we were associated with them in this undertaking. This applies not only to Cleveland, but to their activities in Toledo and any other city in America where they may be engaged in similar undertakings. Messrs. Rhinock and Simms are minority stockholders in the People's Motor Bus Company, St. Louis, the management of which recently came under our control. Other than this I have not now or have I ever had any business dealings or business interests in common with either Mr. Rhinock or Mr. Simms.

It was announced on Dec. 24 that the State Public Utilities Commission has continued until Feb. 11 further hearings on the bus applications of both the People's Motor Bus Company and the Cleveland Railway.

Survey of Transportation to Be Made at Yale

An extended study of the transportation problem in its engineering and economic aspects is to be conducted at Yale, beginning early next year. Official announcement to this effect was made on Dec. 5. The purpose is to determine what program of graduate studies in transportation at Yale is best adapted to the needs of the country and to the personnel and facilities at the university's command. The instruction and research done by other universities and technical schools will also be examined. The survey will be under the direction of Winthrop M. Daniels, professor of transportation; Charles J. Tilden, professor of engineering mechanics, and Samuel W. Dudley, professor of mechanical engineering.

The announcement also said that there will be regularly five Strathcona fellows in transportation at a stipend of $1,000 each, whose appointment is made possible by the fund received by the university in 1914 under the will of Lord Strathcona and Mount Royal. From this fund, which has already provided for two professorships, the Yale Corporation has also established two undergraduate scholarships, each of $600, payable to students showing efficiency and promise in the economic or engineering phases of transportation.

All branches of transportation, on water, land and air, will be considered in this survey, and special attention will be given to the study of their relationship and possibilities of their correlation.

Strike and One-Man Car Suit Are Problems in Dayton

The six street railways of Dayton face a complex situation at present. Five of them are encumbered by litigation arising from the ordinance against the one-man car passed at the referendum election in November, 1923. The status of the litigation is indeterminate as regards the continuance of the injunction in force at present against enforcement of the ordinance, but it will probably be dragged out for some time no matter which side scores first in the fight now in the federal court.

Victory for city attorneys will bring a situation that means barring off the streets about $90,000 worth of rolling stock, which, under the present financial conditions of the companies, will deal them a heavy blow. Victory for the companies will permit them to continue operation of one-man cars but with yet other troubles to combat.

One of these is the labor problem. A strike exists now on the Dayton Street Railway. The road is being operated, but the loss of 30 skilled operators was a blow. Though cars are running on regular schedule, the effect of the strike is to divert considerable travel from this state. The People's Railway employees, belonging to Union No. 810, did not go out but the threat will always exist unless some settlement is made with them.

These two roads were the only ones under union organization. Both locals took a strike vote for use as a weapon by their executive committees. The specific demands were for an increase of pay and for adoption of an association contract, which virtually meant a "closed shop" condition. The men had been getting 55 cents an hour and wanted 75 cents.

Union men say that organization is proceeding also on the City Railway, Oakwood line and the Dayton, Springfield & Xenia Southern. At present, these roads employ their men under individual contract binding them not to organize or join a union.

One of the roads, the D. S. & X. S., is operating under a receivership. Technically, Dayton has a 6-cent fare in cases where a transfer to another line is used. One cent is charged for a transfer. The cash fare, however, for a single ride is 5 cents.

The one-man and wage issues in Dayton have been referred to previously.

Chicago Attorneys Prepare Ordinances for February Ballot

Skeleton ordinances providing for transportation referendums in Chicago in February are being drawn by city attorneys as a legal step toward getting a purchase proposal on the ballot. The ordinances will be completed in detail by Jan. 15, next, for passage by the City Council and a campaign probably will be made to get the voters to agree to a purchase of the Chicago Surface Lines at a figure around $162,000,000. All figures will be in blank until the completion of the surface lines appraisal.

The administration announced that in the event the appraisal is not satisfactory to the Mayor, an alternate ordinance will be submitted, but in either case a subway will be provided for. The main ordinance will call for issuance of around $400,000,000 municipal traction notes, to be known as Schwartz certificates, which will pay for the surface lines, a downtown subway and outlying extensions. The estimated price of the elevated, $90,000,000, also is included but no steps have been taken to get an appraisal of the lines.

Wisconsin Commission Has Jurisdiction Over Proposed Road

New developments have taken place in connection with the proposed plans of C. D. Smith, Fond du Lac, president of the Southern Wisconsin Railroad, to build an electric railway from Madison to Sturgeon Bay, via Fond du Lac and Manitowoc.

The Wisconsin Supreme Court on Dec. 9 upheld the Wisconsin Railroad Commission in its decision requiring this line to obtain a certificate of convenience and necessity in spite of the fact that a charter for the line was obtained from the Legislature in 1897 before the commission came into existence. Mr. Smith maintained in his appeal from a lower court that the charter was a sufficient substitute for the certificate required. The commission will have to approve the certificate of necessity before it authorizes the line's proposed bond issue of $5,700,000.

Work has started on the line near Manitowoc. Future progress depends upon action taken by the commission.

Massachusetts Business Body to Demand Bus Regulation

The Association of Chambers of Commerce of Western Massachusetts has voted to instruct a committee to draft a resolution which will express a demand for legislation regulating bus operation and tending to increase taxes levied on buses.

B. A. Hapgood, secretary of the Springfield Chamber of Commerce, said the failure of railroads to take advantage of their opportunities was encouraging travel by automobile. Ray Baker of Boston, secretary of the Massachusetts Auto Dealers and Garage Association, said the bus owners were willing to co-operate in every practical way with the electric railways and the railroads and that they were ready to pay their proportionate share of taxes for highway maintenance. He said buses should be regulated.

Clark V. Wood, president of the Worcester Consolidated Street Railway and the Springfield Street Railway, said the buses were taking the most profitable short-haul business and that they were so increasing street congestion as to interfere with efficient operation of electric railway cars. He declared that any marked increase of bus service would entail intolerable congestion in the centers.

P. R. T. Offers Ground

The Philadelphia Rapid Transit Company has offered to the city as a gift the Burd tract at 65th and Market Streets as a suitable location for the construction of the Municipal Stadium. The acceptance will rest with the City Council. The Mayor has under consideration an alternative proposal from the Philadelphia Rapid Transit Company for the entire tract on condition that the city accept it subject to a $300,000 mortgage.

Aurora Line to Expand Following Shift in Population

Migration of Chicago's downtown workers westward has resulted in the need for the expansion of the facilities of the Chicago, Aurora & Elgin Railroad, which operates a system of third-rail lines of more than 100 miles connecting Chicago and many populous villages in Cook and Page Counties, Ill. In order partially to meet the cost of new work the company has arranged to sell $775,000 of two-year notes to be offered publicly by the bankers after Jan. 1.

Thomas Conway, Jr., president, said part of the money would be spent to build an artistic brick station in Glen Ellyn, where citizens enlisted the electric line in a city beautification program after seeing what the line had done for Wheaton. The Wheaton station is said to be one of the handsomest in the country and is the first of several by which the line hopes to set a new standard for interurban stations.

New block signals will be installed and there will be flash signals for crossroads. A new freight station will be erected in Elgin. The railway has purchased a 1,300-ft. frontage on Broadway, Aurora, and plans to take tracks off the streets inside the city and relocate them along the bank of the Fox River.

Records kept by the railway for 1921-1924 show that the main towns served have doubled in population in three years and that the number of houses in all communities served has increased 79 per cent.

Reconstruction Program in Oakland Progressing

In fulfillment of part of its construction program, recently entered upon, the Key System Transit Company, Oakland, Cal., expects to receive soon 12 new cars intended for use in its service to the ferries. These are the first cars purchased by the company in two years. The previous purchase was of 55 cars of the one-man, two-man car type. It was intended to operate these cars by a single man, but owing to protests against their operation the cars were never used as originally intended. They are now in service under two-men operation.

The new cars are to be used mostly in two-car trains to replace others which are in need of repair. The traffic in the East Bay cities is growing so fast that during the rush-hour periods of each day practically every bit of rolling stock of the Key System is called into use.

Recently the company has been overhauling, repairing and repainting its cars. This work is still going on, but has proceeded slowly owing to the fact that the demands of traffic make it essential to keep as many cars as possible in service.

The Key System's construction program was undertaken in conjunction with the traffic survey instituted six months ago at the instigation of the city of Oakland. This survey has borne much fruit. As a result of it, buses have been purchased and placed in operation in Oakland and Alameda. It is now proposed to establish an additional bus line in West Oakland, linking that center with the manufacturing sections of Alameda and the estuary area, now inadequately served.

It also appears likely that the Oakland City Council will amend the Key System's franchise so as to give the company more favorable terms than are now enjoyed. This is still a matter of future action, but it is understood that the ground has been laid for a move of this kind and that the railway will make extensions and route changes that will greatly improve service.

A new loop system has been proposed for the business section of Oakland and several lines are likely to be extended to outlying sections of the East Bay if there is favorable franchise amendment action.

One of the changes in the franchise desired by the company relates to street paving. The present agreement specifies that the company must keep the space between its tracks properly paved. In accordance with this agreement the company is now making extensive track repairs and paving various streets, but it is pointed out by traction officials that these charges are unfair and really redound to the detriment of the car rider.

Proposed Indiana Road Renews Application for Right to Build

An application for a further hearing on its petition for a certificate of public convenience and necessity to build an electric railway from Owensboro, Ky., to Elnora, Ind., with a bridge across the Ohio River midway between Owensboro and Rockport, Ind., has been filed with the Interstate Commerce Commission by the Owensboro, Rockport & Chicago Railway, a Kentucky corporation with headquarters at Owensboro.

The renewed application was filed following a report to the commission by C. E. Boles, attorney examiner, and E. Gray, engineer examiner, recommending that the application for a certificate be denied. The examiners reported that the company's estimates of anticipated traffic and revenues appeared to be excessive and that its estimates of cost of construction and of cost of equipment, particularly electric locomotives, appeared too low.

The hearing was held before the Indiana Public Service Commission at Indianapolis last September, at the request of the Interstate Commerce Commission. Officers of the company now state that they did not go more deeply into their estimates at that time because they misunderstood the purpose of the hearing. The Indiana commission recommended that the I.C.C. issue the certificate.

The proposed electric railway would be 84 miles long. The bridge across the Ohio was authorized by Congress last April. The company estimated its construction and equipment costs at $6,767,096, of which $2,125,000 would be for the bridge. It proposed to sell $2,500,000 common stock and $6,000,000 bonds to finance the project. E. T. Franks, Owensboro, is president of the company and Major Thomas H. Hazelrigg, a consulting engineer of Indianapolis, is chief engineer.

Unexpected Answers to Appeal for Service Suggestions

That the use of the bus as a feeder to the lines of the Altoona & Logan Valley Electric Railway, Altoona, Pa., is appreciated by the patrons of the Logan Valley Bus Company, a subsidiary, is shown in the hundreds of answers received to a questionnaire sent out recently by S. S. Crane, general manager. The questionnaire sought suggestions from bus patrons.

The company now maintains eleven buses. Five are operated on regular schedule and six make special trips to relieve the railway during the congested hours. Patrons were almost unanimous in asking for extensions of the five bus routes, faster schedules and more buses.

Complaints were of minor details. One critic protested the "heavy odor of gas" inside the cars, another protested "speeding." One 8-year old, riding the school bus, wrote, "We think it lots of fun, especially the bumps." An afflicted individual wrote that the "steps were too high, especially for a rheumatic person."

The many ideas and suggestions received will be carried out as far as practicable.

New Haven Against Buses

Court Orders Sought by Railroad and United Electric Railways to Protect Their Rights

Action was taken on Dec. 20 by counsel for the United Electric Railways, Providence, and the New York, New Haven & Hartford Railroad before Judge Chester W. Barrows in the Superior Court at Providence with bills of complaint against twenty corporations and persons operating bus lines in Rhode Island. The two transportation companies seek preliminary and permanent injunctions and restraining orders against the bus lines. A hearing on the preliminary injunctions was set for Dec. 29 in the Superior Court.

Railway or Bus

In the bills of complaint the petitioners allege that if the buses are allowed to run it will mean a cessation of railroad facilities. The petitioners claim that the buses are under no regulation, and have asked for no certificates of public necessity and convenience; that the machines are not bonded and not inspected, that no one has control over the fares and the routes and that the buses should not be allowed to continue operations unregulated.

The basis of action is similar to that in a recent case in which William M. Oakley, doing business as the "Overland Limited" between Fall River and Newport, was enjoined from further operation of the line on the prayer of the Newport Electric Corporation under a rescript filed by Judge Barrows.

A. P. Russell, vice-president of the New Haven, said:

> The New Haven cannot longer stand by and see its property jeopardized by this sort of competition. The railroads and electric railways have been authorized to provide transportation for the people of New England. Under that authority the railroads have made an enormous investment.
>
> There may be room for a third transportation agency in New England, but not in the field covered by the railroads and electric railways. The New Haven management feels that any new forms of transportation should be adapted to the use of those existing organizations. Acting on that principle, it will leave no stone unturned to eliminate unfair and unwarranted competition.

Much interest attaches in transportation circles everywhere to the announcement made on Dec. 20 of a plan by which the Boston & Maine Railroad would undergo a physical and financial readjustment, discontinue approximately 1,000 miles of track, obtain $13,000,000 cash for improvements to the lines retained and organize its own motor bus and motor truck service to cover the territory where rail lines are abandoned. Of the 2,450 miles of road more than 1,000 miles handle only 3 per cent of the business. The plan was advanced as part of a general scheme of financial reorganization.

Only Profitable Lines to Be Retained

Homer Loring, chairman of the executive committee of the railroad, is the author of the plan. It will be recalled that it was under Mr. Loring's direction that the Eastern Massachusetts Street Railway was rehabilitated. He cut off practically all of the unprofitable lines or those that give very little promise of soon becoming profitable, and then devoted his energies to the intensive development of the remaining lines with good results.

Leavenworth Gives Railway Bus Franchise

The municipality of Leavenworth, Kan., delivered a bus franchise to the Kansas City, Leavenworth & Western Railways on Dec. 17. Conway F. Holmes, president, considered the terms of the franchise favorable, and believed the company would accept them.

An investment of $50,000 or $60,000 is contemplated, to place in service six 29-passenger buses, to operate over the same routes as covered by the railway tracks, which were in need of expensive renewals. The six buses will equal in number the cars that have been in service.

The Kansas City, Leavenworth & Western interurban line between Leavenworth and Kansas City is in better form than in several years, the freight business thriving and the passenger service not having shrunk more than one-fourth in the recent months of interurban bus development.

Contracts Planned for Washington Heights Subway

Following a public hearing on Dec. 17 by the Board of Transportation of New York City on the terms and conditions of the contract for the construction of the Washington Hights subway, which is to be a part of the Manhattan trunk of the city's new subway system, it was announced that the contract drawings for two sections of the line from 111th Street to 131st Street had been completed and that invitations to contractors to bid on the construction would be ready for advertising during the week which will end Dec. 27.

One small section of the line has been under construction since last August.

The construction will be divided into fourteen contracts.

Insurance Fund Impaired by Peculations

Caleb S. Jackson, for many years treasurer of the Eastern Massachusetts Street Railway, has resigned because of irregularities in his account with the Eastern Mutual Insurance Company, of which also he was treasurer. His resignation from both concerns has been accepted. Robert B. Stearns, vice-president and general manager of the Eastern Massachusetts, has been designated by the trustees to take temporary charge of the financial department of the railway.

From a careful examination of the accounts and securities of the Eastern Massachusetts it is learned that they are not impaired, or in any way affected, by the handling of the funds of the Eastern Mutual. Present information indicates an unlawful use of $48,000 of the funds of the Eastern Mutual, which is a subsidiary of the Eastern Massachusetts, organized wholly for the purpose of handling the workmen's compensation claims of the employees of the Eastern Massachusetts.

Free Bus Restrained

Future of Community Buses Up to California Commission—Electric Railways Seek Rights

After the close of a two-day hearing before Commissioner W. J. Hanford of the California State Railroad Commission in Los Angeles, the Community-Merchants' Bus Service now awaits a decision from the state body as to its future existence. The operators of the free bus system have been defying the orders of the court by operating their buses from Los Angeles, Culver City and Venice without a certificate, but after they had been fined for contempt of court they decided to cease operations and apply for a permit to continue operations. They have also decided to offer no further resistance to the courts until the Railroad Commission has decided the matter.

Railway Opposes Plan

The application of the Merchants' Bus Service, formerly known as the Community (Free Buses) Bus Line, was considered at a hearing based on an application of the Pacific Electric Railway. That company sought permission for a franchise to operate a bus line from Los Angeles to Culver City and Venice, but over a slightly different route from the one outlined in the application of the Merchants' Bus Service. The railway proposed to run its buses so as to connect with its electric cars at Los Angeles and operate along Washington Boulevard all the way to the proposed terminus at Venice. The railway planned to charge the same fares for its proposed bus line as are now charged on its electric interurban trains operated between Los Angeles and Culver City and Venice.

The Free Bus System seeks permission to continue its present schedule of fares, namely 10 cents from terminus to terminus. But the bus service is not rendered complete in going between Venice and Los Angeles, as the passengers are picked up or unloaded at the city limits of Los Angeles or at the end of the Los Angeles Railway's Washington Street line, whereby passengers are obliged to pay a 5-cent fare on the local car line in Los Angeles.

The electric line offers a system of fares which consists of round-trip rates, family, commutation and other special fares, which in some cases give rides for less than the bus men charge.

Plea for Co-ordination

At the hearing J. Ogden Marsh, chief engineer of the Los Angeles Board of Public Utilities, stated that the Board of Public Utilities of Los Angeles was engaged in trying to unify into one system the local street car lines in Los Angeles of the Pacific Electric Railway and Los Angeles Railway, as well as all bus lines for improvement and continuity of service and to make universal transfers possible. For that reason, he said, the board favored the granting of bus line franchises to the street railways.

The Pacific Electric Railway informed the commission that it had eight new 29-passenger buses available for the new service, provided the commission approved of the railway's application.

Inquiry Conducted Into Oakland Wreck

The worst accident in the history of East Bay electric train service occurred during the rush hour the morning of Dec. 4. A single car train of the Sacramento Short Line, westward bound, crashed into a four-car train of the Key System Transit Company on the Key line's fill a short distance from the Oakland mole. The Sacramento car telescoped the lighter rear car of the Key train half its length, killing six passengers and maiming 22 others. Subsequently two of the injured died in hospitals, bringing the death list up to eight.

Immediately after the accident investigations were started by the coroner, the State Railroad Commission and by each of the two railroads. The problem of fixing responsibility proved a knotty one, owing to the peculiar conditions under which that portion of the road on which the crash occurred is operated.

Details of Operation Developed

The fill is the property of the Key System Transit Company, but is used jointly by the Key and Sacramento trains. The switches and safety devices are all under Key System control. Trains running on the fill are subject to the orders of Key officials. These facts were brought out at the hearing in the Key Building in Oakland the day after the wreck by H. A. Mitchell, vice-president and general manager of the Short Line. Mr. Mitchell produced a contract dated Jan. 20, 1911, in support of his testimony. E. E. Thornton, division superintendent of the Key System, however, denied that his company was responsible for what Short Line employees do while operating their own trains on Key tracks. To this Mr. Mitchell replied that no men are put on Short Line trains that operate over Key Line tracks until they have been passed upon by Key System officials. Manager Thornton accused the Short Line motorman of being in a previous crash with a Piedmont Key train at Fortieth Street and Telegraph Avenue. Mr. Thornton said:

> If the motorman of the Sacramento train had been working under Key System regulations there would have been no subsequent accident in which he could have participated, for the reason that he would have been disqualified from further service.

He further explained that all Key System trains are equipped with a "dead man" device.

Mr. Mitchell admitted that his train did not have such a device, but explained that it was equipped with other safety devices.

Testimony at the hearing showed that the signals on the fill were found to be in good working order after the accident. It was also brought out that the brake valves of the Short Line car were inspected before the accident and found to be in perfect working order. The brakes and brake devices, examined after the wreck, were found to be in excellent condition.

These points were brought out at the hearing:

1. That the Key train had come to a complete stop before the crash.
2. That the Short Line train went by at least two danger signals.
3. That it had been raining and the tracks were slippery.
4. That the crash came about 30 or 35 seconds after the Key train had stopped.
5. That the Short Line train was traveling at the rate of about 30 m.p.h. when first sighted by members of the crew of the stalled train.
6. That there was good visibility.
7. That both trains were late.
8. That there are no speed regulations on the fill.

Members of the board of inquiry named by the Key System and Short Line included:

Frank Mott, former Mayor of Oakland; Samuel Irving, former Mayor of Berkeley; J. C. McPherson, superintendent of the East Bay division of the Southern Pacific Company; W. Arnstein, president; L. H. Rodehaugh, traffic manager, and F. A. Miller, superindent of power and equipment of the Sacramento Short Line; W. R. Alberger, vice-president and general manager of the Key System Transit Company; J. P. Potter, superintendent of transportation of the Key Line, and W. P. Jackson, master mechanic of the Key.

Mr. Mitchell declared that the fact that the frame of the Short Line car was higher than the frame of the Key Line car accounted for the telescoping.

Litigation in Spartanburg Officially Ended

The mandate of the Supreme Court of the United States, affirming the judgment of the Supreme Court of South Carolina in the case of the city of Spartanburg against the South Carolina Gas & Electric Company was filed in the office of the Supreme Court of South Carolina recently. This permanently ends one of the biggest cases that has ever been tried in Spartanburg. This was a proceeding in mandamus to compel resumption of street car service.

The case was practically settled by consent. Some weeks ago R. L. Peterman, manager of the Barstow interests in South Carolina, new owners of the South Carolina Gas & Electric Company, appeared before City Council and voluntarily agreed to withdraw their appeal. The city agreed to this, and under this arrangement the appeal was abandoned and ordered dismissed by the court.

The Barstow interests agreed to abandon the appeal of the South Carolina Gas & Electric Company from the South Carolina Supreme Court's decision on the ground that they did not care to be working under the disadvantage of a long-standing litigation.

The new company has petitioned for a 10-cent fare between Morgan Square and the city limits. A 10-cent fare has been in effect for some time on the car lines between East Spartanburg and Clifton. A 7-cent fare was charged within the city limits by the South Gas & Electric Company under the old ownership and prior to the discontinuance of car service in the city. Ten cents was also charged outside the city limits. At present a 10-cent rate is in effect on the buses. The new owners for several months have been at work rehabilitating the old car system.

News Notes

Court Allows One-Man Cars Temporarily.—On the day that the ordinance prohibiting one-man car operation on the lines of the Connecticut Company in New Haven, Conn., was to become effective an injunction was obtained by George D. Watrous, representing the company, from Judge Isaac Wolf of the Superior Court permitting the present status of operation to continue until Jan. 6. The injunction enjoined the chief of police and city officials from attempting to enforce the provisions of the ordinance recently passed by the Board of Aldermen. The action of the board was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 6. The hearing on Jan. 6 will be to determine whether the injunction shall be made permanent.

Considers Utility Courses.—The University of Oklahoma has under consideration the offering of utility courses in its regular curriculum. Such utility studies were recently added to the course of work in the University of Pennsylvania.

Railway Service Wanted.—More than 100 residents of Marlboro, Mass., have filed a petition asking the City Council to exert its influence to retain the service of the Worcester Consolidated Street Railway on the Northboro road section. The railway officials threatened to abandon service between Marlboro and Northboro if business fell off because of bus competition. The City Council decided not to restrict bus lines with reference to taking on and discharging passengers on the route between Marlboro and Westboro. The Marlboro Chamber of Commerce likewise is against any drastic change in the present transportation arrangements. The railway fare is 59 cents one way between Marlboro and Worcester, while Terry Carlstrom, bus proprietor, has announced he would sell 12 tickets for $4 or at the rate of 33⅓ cents a trip.

Advertisements Told Strike Story.—The Illinois Traction System, Chicago, Ill., told the story of the incidents leading up to the recent strike situation and its position in the matter by means of display advertisements in the papers in its territory and a series of letters to employees. By these means the people in its territory were offered every opportunity to know all of the facts concerning the situation. E. E. Soules, manager of the publicity department of the railway company, directed the work of placing the statement with the newspapers.

Life Insurance Increased.—Employees of the Kansas City, Leavenworth & Western Railway, Kansas City, Kan., have increased their group life insurance coverage by more than $63,000, bringing the total in force to about $150,000. Both the original and additional insurance policies were issued by the Metropolitan Life Insurance Company on the co-operative group plan, under which the railroad company and the workers jointly pay the premiums.

New Franchise Increases Service.—Interurban service between Cleveland and Bedford, Ohio, will be increased by the Northern Ohio Light & Traction Company and the fare increased by 5 cents. This follows a referendum vote of approval on a new franchise for the company by the voters of Bedford.

Court Dismisses Old Suit.—A suit involving reversion of the Omaha & Council Bluffs Street Railway's property to the city of Omaha, Neb., and popularly supposed to be still on a District Court docket, subject to an order to reopening, was dismissed at the city's cost by the court on Dec. 11. This suit grew out of the first franchise grant made to the Omaha horse railway in 1867. The grant specified that the property of the company should revert to the city after 50 years. The company was absorbed by the lines that went later into the present system.

Fares Lowered.—The Maine Public Utilities Commission has rendered a decision permitting the Androscoggin & Kennebec Railway, Lewiston, to make changes in its fare zones which will give many patrons a 10-cent reduction on every trip because of the extended fare limits. In view of the fact that the proposed changes in the fare zone limits would result in an extension of the present fare limits and would be of mutual benefit to the petitioner and patrons, the commission said it would approve the petition.

Will Petition for Charter.—Judge J. Moss Ives, receiver of the Danbury & Bethel Street Railway, Danbury, Conn., and others associated with him will petition the Connecticut General Assembly for a charter to operate an electric railway system and power generating plant. The company will be designated as the Danbury & Bethel Power & Transportation Company, and if authorized may take over the company now operating, foreclosure of which has been ordered by the court on the petition of first mortgage bondholders. It is also proposed to take over charters of the Danbury & Bethel Traction Company, and the Bridgeport & Danbury Electric Railway.

Old Equipment in Service. — The Illinois Power & Light Company has placed a bus in service between the center of Des Moines and the power plant of the company located some 6 miles southeast of Des Moines. The bus was one acquired from some of the original bus operators in Decatur, in which city the company has co-ordinated the railway and bus service. The bus is used merely to haul the workmen between the plant and the city. The company has also placed in service between South Omaha, Neb., and Ralston, three buses acquired from the old equipment in Decatur at the time of the purchase. These three buses supplement service to the interurban line between the two towns.

New Proposal Offers Bus. — The Philadelphia Rapid Transit Company, Philadelphia, Pa., has requested permission of the Delaware River Bridge Joint Commission to operate a bus route across the Delaware River Bridge, connecting Philadelphia with a suitable place in Camden. The plan would afford passengers the same fares and transport privileges as obtain now in Philadelphia. The company wrote to the Delaware River Bridge Joint Commission a few months ago asking to extend the transportation system, offering both street car and bus service. Later, at a hearing before the executive committee of the Bridge Commission, details of the proposed service were discussed. Since that meeting the company has been requested by the Reading Railroad to consider a bus route over the bridge to Camden which would give service to the Reading's new Camden terminal.

Christmas Checks for Safe Work.—Christmas letters in the form of checks were received recently by 321 motormen, conductors and operators of the Nashville Railway & Light Company, Nashville, Tenn., as a bonus for their work in the safe operation of street cars for the past three months. The amount paid out by the company this quarter was $3,140, increasing the total bonus payments in the safety campaign for the past 11 months to $7,383. According to John J. Connors, safety director of the company, the safety campaign has been responsible to a great extent for the 60 per cent reduction in street car accidents since 1920.

Wants Fare Increase.—Officials of the Milford & Uxbridge Street Railway, Milford, Mass., recently asked the State Department of Public Utilities for an increase in fares from 10 cents to 13 cents with the right to sell nine tickets for $1. Children's and workmen's fares would not be increased. The officials claimed that no dividends had been paid since 1916 and that this year no taxes could be paid or interest on loans.

Placards Will Tell Story.—Councilman Philip Tindall will ask the City Council of Seattle, Wash., to provide for printing placards to set forth the financial progress of the Seattle Municipal Railway. He states that Seattle's railway has spent approximately $2,000,000 in rehabilitation of the system since the property was taken over by the city on April 1, 1919; this in addition to the paying of all operation and maintenance expenses, paying off bonds and meeting interest payments. He plans to acquaint the people of the city with the true status and accomplishments of the line since it became city property.

Spencer Circulates Car Petitions.—Petitions are now in circulation in Spencer Mass., for presentation to the Worcester Consolidated Street Railway to show that there is sentiment for restoration of the lines to Leicester and Worcester, Mass., discontinued some months ago. It is proposed to open the question to general discussion at the town meeting in March.

Wins Road Ownership.—Cliff Little of Gadsden, Ala., is awarded the property of the Gadsden, Bellvue & Lookout Railroad, in North Alabama, in a case decided by the Circuit Court at Gadsden, Ala. on Dec. 15. The road operates from Gadsden, Ala., for several miles through the mountain section of North Alabama. It was alleged that the owners refused to refund money paid out by him for running the road or give him possession of it. Under the decision of the court the owners may hold the road in the event they immediately refund this money, together with interest and attorney fees. Otherwise the road becomes the property of Mr. Little.

Expert's Report Awaited.—Milo R. Maltbie, New York, has been engaged by the Cincinnati, Ohio, Chamber of Commerce as the expert adviser of that organization's traction committee. Mr. Maltbie has started his work and expects to have a preliminary report ready by Jan. 1 on the traction situation in Cincinnati.

Bonus Checks Distributed. — Bonus checks totaling $106,680 were distributed to 2,330 motormen, conductors and safety car operators on Dec. 15, under the merit and bonus system of the Los Angeles Railway, Los Angeles, Cal. This is the fifth Christmas season in which the bonus has been paid. A new high record is established in the amount paid and in the number of men receiving checks. The Christmas bonus is in the form of payment for special service rendered by trainmen during the year.

To Grant Petition Would Be Discriminatory.—Taking the view that a discriminatory action was being asked, the Board of Public Utility Commissioners of New Jersey denied the request of employees of the Pennsylvania Railroad for a modification of the Public Service Railway fare zones from Jersey City and the Meadow Shops at Kearney and from Newark to the Meadow Shops. The board held it would be unjust to change the zones in favor of these employees without extending the same privilege to all passengers. It said that while the present municipal zoning system might require modification in the future, such modification should not be made under this application.

Wants to Run One-Man Cars.—The Northern States Power Company has petitioned the Wisconsin Railroad Commission for permission to establish one-man car service on its line between Eau Claire and Chippewa Falls. At the hearing no opposition of residents was voiced.

Urge Widening Woodward Avenue.—Sidney D. Waldon, president of the Detroit, Mich., Rapid Transit Commission, recently stated his reasons for recommending the widening of Woodward Avenue, to be available for a four-track route. He believed that measures should be taken at once to adopt a uniform width of 120 ft. on the avenue from the Detroit River to the entrance of Palmer Park. The recommendations were made in a letter sent to the Woodward Avenue Improvement Association, which had asked for information as to the necessity of widening the thoroughfare. The association's letter, which was signed by John M. McKerchey, president, asked the commission to state the reasons it had to offer for recommending the expenditure of the sum required for the widening project. The Detroit *News* of Nov. 16 referred to the transit commissioners' suggestions.

Financial and Corporate

Plans Acquisition of Bus Company

Detroit Street Railways to Serve Sections of the City Now Without Transportation Facilities

The immediate establishment of bus service in certain sections of the city of Detroit and the ultimate taking over of the Detroit Motor Bus Company are in line with the new policy of the Department of Street Railways, according to a general outline of the transportation question by Mayor John W. Smith. Mr. Smith pointed out that the acquisition of the bus company's property must come eventually, and that the fact is realized by city officials and directors of the bus company.

The Department of Street Railways plans to have immediately a fleet of 25 buses to serve sections of the city which as yet have no transportation facilities and the bus service will be augmented as soon as the Council formally approves the purchase of the new double-deck buses recommended by the Street Railway Commission.

Before the city can proceed very far with plans for a complete and unified transportation system including street cars and buses, according to the mayor, legislation is necessary which will establish for the city the rights to its streets. The existing laws give the city the right reasonably to control the use of the public streets but an ordinance must be passed giving the city more complete control of the pavements. The mayor cites that at the present time a score of bus companies are operating into the city of Detroit from neighboring municipalities. The solution of this problem is one of the first to be faced by city authorities, the Mayor considers.

It is believed by Mayor Smith that the decision handed down by the Supreme Court in the case now pending concerning the right of the city to control its streets as far as the jitneys are concerned will pave the way for the passage of an ordinance relative to bus operation in the city.

To the Street Railway Commission will be left the working out of a proper system of bus transportation in the outlying districts. It is claimed that in some of the districts, citizens have to walk a mile or even farther to get to a street car. It is in these sections that the bus will be used to carry passengers to the car lines and transfers will be issued for the trip down town.

Immediate contracts for five buses from each of the three bidders who bid upon the city's request for proposals on 50 buses are urged by the Mayor and the Street Railway Commission but formal approval of this action has not yet been given by the City Council. The commission points out that immediate contracts should be let to insure delivery of the buses by spring. It is not anticipated that the buses will operate into the down town section for the present at least. They will be used only as feeders in connection with the car lines.

The Mayor believes that the eventual acquisition of the Detroit Motorbus Company's property is necessary in order that a maximum of service may be rendered the public. With the present company running equipment on parallel routes with the street car lines the most efficient service cannot be accomplished. It is pointed out that as the bus company is operating under a day-to-day agreement without a franchise, not much change would result from the city's acquisition of the bus company's equipment. Although the buses could be stopped from running on very short notice it is realized that a valuable service is being rendered by the buses and there is no disposition on the part of city officials to take any action that might result in discontinuing the bus service.

Sale of 26-Mile Road Sanctioned

The property of the Interstate Consolidated Street Railway, Attleboro, Mass., is to be sold at public auction by Zenas W. Bliss, the receiver. Judge Crosby of the Supreme Court of Massachusetts has authorized the sale. As receiver Mr. Bliss asked for authority to sell on the ground that the company cannot earn its cost of maintenance; that it is unable to meet its obligations as they mature, and that it would be of no advantage to the creditors, stockholders or the public to continue the receivership. The road operates 26 miles of line from Plainville, in Wrentham, through North Attleboro and Attleboro to the Rhode Island line, and a line from Attleboro to Seekonk to the Rhode Island line. The sale will be held in Attleboro.

$51,138 Below Return

Rochester Lines Show Deficits on Railway and Bus Operations—3,000,000 Fewer Passengers

For the fourth year under the service-at-cost contract the Rochester lines of the New York State Railways failed by $51,138 to get the 6 per cent return on their base value guaranteed by the contract. This fact was disclosed in the recent report of Charles R. Barnes, city railway commissioner, for the year ended July 31. The base value for the year covered by the report is stated at $19,573,606. The detailed results are shown in the accompanying table.

The returns are fixed at $1,162,598 for street car operations and $5,465, for the bus lines or a deficit of $41,890 and $9,249 respectively. The company began the operation of buses on Nov. 1, 1923. The shortage for the four years since the inception of the service-at-cost contract follows: First year, $133,998; second year, $94,001; third year, $47,642, and fourth year, $51,139.

Nearly 3,000,000 fewer passengers were carried for this year than in the preceding one, although 94,448 car-miles were run. This represented the high water mark since the signing of the contract. The unusually open winter, making possible greater use of autos, and adverse business conditions in the early part of the year are held responsible for the decline.

Commissioner Barnes commented upon the fact that the automobile affects the lines adversely in two ways, decreasing revenues by taking away passengers and by adding to the traffic congestion, retarding the movement of cars and increasing operating costs. The retarding of car movement has been acute since the city of Rochester installed a signal light control system on its main street, creating a problem for street cars and vehicles, particularly the former.

RESULTS OF OPERATION AT ROCHESTER FOR YEAR ENDED JULY 31, 1924

	Railway	Co-ordinated Bus Lines*	Combined
Revenue from transportation—			
Passenger revenues	$5,027,845	$41,117	$5,068,962
Miscellaneous transportation revenues	2,533	.....	2,533
Total revenue from transportation	$5,034,081	$41,920	$5,078,011
Revenue from other operations			
Station and car privileges	$49,562	.....	$49,562
Rent from tracks and facilities	42,297	.....	42,297
Rent from buildings and other property	34,577	.....	34,577
Total revenue from other railway operators	$126,436	$41,929	$126,436
Total operating revenue	$5,160,518	$41,929	$5,202,447
Railway operating expenses			
Way and structures	$490,806	$1,296	$492,103
Equipment	402,758	4,890	407,648
Power	285,847	4,428	290,275
Conducting transportation	1,782,188	20,823	1,803,812
Traffic	14,375	.....	14,375
General and miscellaneous	514,789	7,633	522,422
Renewals and depreciation	190,000	6,272	196,272
Total operating expenses	$3,680,765	$45,344	$3,726,110
Net revenues from railway operations	$1,479,752	$3,415	$1,476,337
Auxiliary operations—revenues	6,357	.....	6,357
Auxiliary operations—expenses	5,467	.....	5,467
Net revenue from auxiliary operations	$890	.....	$690
Net revenue from all operations	$1,480,642	$3,415	$1,477,227
Taxes assignable to operations	370,466	368	370,834
Operating income	$1,110,176	$3,785	$1,106,392
Non-operating income	10,531	.....	10,531
	$1,120,708	$3,783	$1,116,924
Return on investment	1,162,598	5,464	$1,168,063
Deficit	$41,890	$9,248	$51,138

* Bus operation started Nov. 1, 1923.

Submits Report on Denver Tramway Operation

E. Stenger, receiver of the Denver Tramway, Denver, Col., recently presented the following report to the United States District Court covering operations from Dec. 24, 1920, when he was appointed receiver, to Oct. 31, 1924:

CONDENSED STATEMENT OF NET INCOME PERIOD DEC. 24, 1920, TO OCT. 31, 1924

	Accumulative Dec. 24, 1920, to Dec. 21, 1923	January to October, 1924	Accumulative Dec. 24, 1920, to Oct. 31, 1924
Total revenue from transportation	$14,136,741	$3,733,107	$17,869,848
Total revenue from operation other than transportation	514,900	162,308	677,208
Total operating revenue	$14,651,641	$3,895,415	$18,547,056
Total operating expenses	9,802,256	2,542,433	12,344,689
Net operating revenue	$4,849,385	$1,352,981	$6,202,366
Total miscellaneous income	36,462	20,910	57,372
Gross income less operating expenses	$4,885,847	$1,373,891	$6,259,738
Total deductions from income	4,237,966	1,178,117	5,416,083
Net income	$647,881	$195,774	$843,655

Georgia Interurban in Danger of Suspension

Preston S. Arkwright, president of the Georgia Railway & Power Company, Atlanta, Ga., recently sent a letter to the Mayor and the Council of Marietta protesting the establishment of bus lines and warning that the interurban railway could not continue to operate under bus competition. The letter stated that granting permission to operate a bus between Atlanta and Marietta over a public highway supported in part by the railway was unfair and such operation was taking away essential revenue. He said that the Atlanta Northern Railway was opened for operation in 1905, and in every place possible along all parts of its route outside of incorporated cities it was built upon a private right-of-way bought and paid for by the railway. In the 19 years of its existence the company has not paid a single dollar in dividends, but has accumulated a floating debt of $145,000. In 1923 it failed by $11,550 to earn bare operating expenses, taxes and renewals. He said that the Atlanta Northern Railway could not face bus competition as the electric lines in Atlanta had been forced to face jitney competition. He said that there was no public convenience served by these buses and that their continuance would seriously hamper, if not completely destroy, the effectiveness of the electric railway.

276,460,074 Passengers Carried by Wisconsin Railways

The public utilities in Wisconsin have shown a steady growth with a total valuation on Dec. 31, 1923, of $376,679,440, according to the biennial report of the Wisconsin Railroad Commission for 1922-1923. This is an increase of 60.13 per cent over the $235,332,138.13 valuation of utility properties on June 30, 1917.

The electric railways showed losses in the number of passengers carried in the last few years. A high mark of 287,905,241 passengers was established in 1920 compared with 222,508,368 in 1917. In 1922 the total number of passengers carried during the year dropped to 262,110,613, while in 1923 the number of passengers carried increased to 276,460,074. Operating revenues increased from $11,323,223.38 in 1917 to $20,032,358 in 1922. Expenses, however, increased even more rapidly and the ratio of expenses to revenues rose from 74.61 per cent in 1917 to 84.6 per cent in 1922, and by the end of 1923 this figure had decreased only 1 per cent, although the revenues for 1923 had increased to $22,397,270.

Discontinuance of Train Service Allowed in Niagara Section

Upon the assurance of the New York Central Railroad that it will sell commutation and special trip tickets good between Suspension Bridge and Lewiston at its ticket office at Suspension Bridge and that all tickets reading to or from Lewiston via New York Central will be honored on the Niagara Gorge Railroad and Niagara Gray Bus Line, the Public Service Commission on Dec. 12 permitted the New York Central to discontinue its train service between Suspension Bridge and Lewiston.

At a hearing on Nov. 7 on the commission's order to the Central to show cause why it should not continue service, it was brought out by the railroad that an arrangement had been made whereby the Niagara Gorge Railroad will operate cars between Niagara Falls and Lewiston in connection with New York Central trains. The Niagara Gorge Railroad also operates the Niagara Gray Bus Line, operating between Niagara Falls and Lewiston and beyond, giving practically a two-hour service each way. The commission reserves the right to direct the resumption of train service.

Divisible Receipts Greater in Chicago

The Chicago Surface Lines announced a substantial gain in its 45 per cent of divisible receipts for November over the same month a year ago, though a slight falling off from October. The city gets 55 per cent of the net receipts. The Surface Lines share was $132,981 for November, 1924, against $86,685 for November, 1923, and $169,523 for October, 1924. The company's efforts to reduce operating expenses are shown in the comparison of $3,727,303 November expenses and $3,877,750 in October. Trainmen received $1,683,001 wages as against $1,785,503.

The number of passengers carried in November declined to 120,540,271, against 127,729,691 in October, but the average fare rose from 3.82 cents to 3.83. A compared income account for the two months shows:

	November	October
Gross earnings	$4,710,210	$4,963,509
Expenses	3,727,303	3,877,750
Residue receipts	982,986	1,085,759
Joint account expense	20,000	20,000
5 per cent interest on purchase price	667,391	689,040
Divisible receipts	295,515	376,718
City's share	163,533	207,195
Company's share	132,981	169,523

Conspectus of Indexes for December, 1924

Compiled for Publication in this Paper by

Albert S. Richey
Electric Railway Engineer
Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War: High	Since War: Low
Street Railway Fares* 1913 = 4.84	Dec. 1924 **7.17**	Nov. 1924 **7.17**	Dec. 1923 **6.89**	May 1921 **7.24**	May 1923 **6.88**
Street Railway Materials* 1913 = 100	Dec. 1924 **148.7**	Nov. 1924 **148.6**	Dec. 1923 **155.5**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Street Railway Wages* 1913 = 100	Dec. 1924 **220.8**	Nov. 1924 **220.7**	Dec. 1923 **216.4**	Sept. 1 20 **232**	Mar. 1923 **206 8**
Steel—Unfilled Orders (Million Tons) 1913 = 5.91	Nov. 30 1924 **4.03**	Oct. 31 1924 **3.53**	Nov. 30 1923 **4.37**	July 31 1920 **11.12**	July 31 1924 **3.19**
U. S. Bank Clearings Outside N. Y. City (Billions)	Nov. 1924 **16.62**	Oct. 1924 **18.02**	Nov. 1923 **15.92**	Mar. 1920 **18.54**	Feb. 1922 **10.65**
Business Failures Number	Nov. 1924 **1,460**	Oct. 1924 **1,573**	Nov. 1923 **1,653**	Jan. 1924 **2,231**	Sept. 1924 **1,277**
Liabilities (millions	**29.01**	**45.96**	**63.92**	**122.95**	**27.71**

	Latest	Month Ago	Year Ago	Since War: High	Since War: Low
Eng. News-Record Construction costs 1913 = 100	Dec. 1924 **208.6**	N v. 1924 **205.7**	Dec. 1923 **217.3**	June 1920 **273.8**	Mar. 1922 **162.0**
U.S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Nov. 1924 **152.7**	Oct. 1924 **151.9**	Nov. 1923 **152.1**	May 1920 **247**	Jan. 1922 **138**
Bradstreet's Wholesale Commodities 1913=9.21	Dec. 1 1924 **13.53**	Nov. 1 1924 **13.35**	Dec. 1 1923 **13.44**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
Dun's Wholesale Commodities 1913 = 120.9	Dec. 1 1924 **193.0**	Nov 1 1924 **193.7**	Dec 1 1923 **190 9**	May 1 1920 **263.3**	July 1 1921 **159.8**
U.S. Bur. Lab. Stat. Retail food 1913 = 100	Nov. 1924 **150**	Oct. 1924 **149**	Nov. 1923 **151**	June 1920 **219**	Mar. 1922 **139**
Nat. Ind. Conf. Bd. Cost of living 1914 = 100	Nov. 1924 **165.2**	Oct. 1924 **165.0**	N v. 1923 **165.3**	July 1920 **204.5**	Aug. 1922 **154.5**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population.

Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials.

Wages index is relative average maximum hourly wage of motormen, conductors and operators on 100 of the largest street and interurban railways in the United States, weighted according to the number of such men employed.

Raleigh Company Not Reorganized

It was erroneously stated in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 20, 1924, that the Carolina Power & Light Company, Raleigh, N. C., had been acquired by J. G. White Company and reorganized. The company acquired by J. G. White Company is the Carolina Light & Power Company, Aiken, S. C. The Carolina Power & Light Company operates the railway system in Raleigh, N. C., and also does a general lighting, power and gas business. The Carolina Light & Power Company is a power and lighting property. It does no railway business.

Auction Sales in New York.—At the public auction rooms of A. H. Muller & Sons there were sold this week $45,000 Shawnee-Tecumseh Traction Company, Shawnee, Okla., first mortgage 5 per cent 10-20 year gold bonds, due 1926; June, 1922, coupons on; 20 per cent.

Short Line Given Up.—Fitchburg & Leominster Street Railway has abandoned its 5-mile line between Fitchburg and Lunenburg, Mass. The action of the road was due to lack of patronage, which made operation a loss. Bus line owners are investigating the possibilities of operating between Fitchburg and Lunenburg.

Income Lower.—For the 5 months of the fiscal year ended November, 1924, the net corporated income of the Brooklyn City Railroad, Brooklyn, N.Y., was $595,493, against $792,341 for the corresponding 5 months in the last year. The passenger revenue for the 5 months ended with Nov. 30, 1924, totaled $4,708,989, while for a similar period in 1923 this item stood at $4,880,417. Expenses and taxes for the period this year were $4,090,439, which differed slightly from that of last year, when the figure was $4,048,268.

Balance Lower—Bus Service Extended.—For the eleven months ended Nov. 30, 1924, the gross income of the Republic Railway & Light Company, New York, N. Y., amounted to $9,557,946, against $9,027,895 for a similar period last year. The balance for depreciation, dividends and surplus amounted to $578,232 for the period of January through November of the current year and $635,363 for a similar period of 1923. The company, through its subsidiaries, operates 23 buses in interurban service and 57 buses in city service. Recently an important subsidiary, the Pennsylvania-Ohio Power & Light Company, started bus service between New Castle and Sharon. In the Nov. 29 issue of the ELECTRIC RAILWAY JOURNAL this company was inadvertently referred to as the Pennsylvania Power & Light Company.

Approve Liquidation Plan. — The stockholders of the Railways Company General approved a plan for the proposed liquidation of the company on Dec. 10. The property of the company is held by two corporations. The Railways Company General, which is a New Jersey corporation, has for some years held securities of several electric railways and accounts receivable, among which is the entire capital stock of the Victory Park Land & Improvement Company, Inc. The latter company is a New York corporation and was organized to hold the real estate owned by the Railways Company General. The assets of the Railways Company General will be transferred to the Victory company for an arbitrary consideration. Each stockholder of the Railways Company General can surrender his stock and take his pro rata share of the Victory company stock. As the capitalization now exists, this will give to each shareholder of Railways Company General two shares of Victory Company for one share of Railways Company General that he now holds.

Revenue Up.—For the eleven months months ended Nov. 30, 1924, the Philadelphia Rapid Transit Company, Philadelphia, Pa., had a net income of $1,895,868, against a net income in 1923 of $1,890,437. The passengers carried totaled 829,812,333 in the period from January to November, 1924, and 836,817,620 for the similar period in 1923. The passenger revenue from January to November this year amounted to $40,669,902 and for the 11 months of 1923 the amount was $40,265,921. Passenger statistics for November, 1924, the second full month of operation on the new fare, show that 74,087,646 passengers were carried, bringing a revenue of $4,010,418 against a revenue in November, 1923, of $3,771,562. The number of 8-cent fare passengers during November this year was 2,833,384. The 7½-cent token passengers totaled 48,581,229. The 5-cent fare zone line passengers numbered 1,100,404. Transfer passengers totaled 18,835,463.

Abandoned Property to Be Sold.—All the property of the Nevada County Traction Company, which formerly operated between Nevada City and Grass Valley, Cal., will be sold Jan. 17, 1925, by Frank Steel, commissioner named by the Superior Court. The sale is to satisfy a judgment of $67,000 obtained by the Mercantile Trust Company, San Francisco. Almost a year ago the company petitioned the California Railroad Commission for permission to abandon railway service. The property of the company was covered by a mortgage which was ordered foreclosed and sold by the Superior Court.

Ordered to Sell Power Equipment.—The receivers for the Dayton, Covington & Piqua Traction Company were directed to sell three boilers in the company power plant at West Milton, Ohio, for not less than $4,500 in an order filed in U. S. District Court recently by Judge Smith Hickenlooper. The receivers in their application pointed out to the court that a saving of $10,000 had been recorded annually by purchasing their power from foreign sources.

Commission Approves Issue. — The Public Utilities Commission of the District of Columbia has authorized the Washington Railway & Electric Company to sell $1,850,000 of general and refunding mortgage 6 per cent, ten-year gold bonds, secured by mortgage of Nov. 1, 1923. The issue is for the purpose of retiring a similar amount of Metropolitan Railway first mortgage 5 per cent bonds, due Feb. 1, 1925.

Appeals on Tax Decision. — Judge Thomas Bailey of the County Court recently decided that the Lewistown & Reedsville Electric Railway, Lewistown, Pa., must pay $4,000 annually for ten years for use of the Juniata River bridge, between Lewistown and Lewistown Junction. Following this announcement the company decided it would discontinue service across the bridge on Dec. 31. Through the efforts of the Chamber of Commerce, the county, the railway representatives and business firm representatives met in the community hall to consider the company's action in suspending action over the bridge. Day & Zimmermann, Inc., manager of the railway, were represented by J. A. Dewhurst and Chester Wilson. The company made a report of its business. During the twelve months period ended Oct. 31, 2,230,000 revenue passengers were handled at an average fare of 6.58 cents. Of the more than 2,000,000 people who were carried during the past year, 434,000 rode on cars over the river bridge. The company has taken an appeal from the rental decision. It states that an agreement could come about by passing the tax to the users of the bridge, discontinuing the existing railway service as a losing venture and substituting buses.

Boston Road Does Well.—The Boston Elevated Railway, Boston, Mass., showed a profit for operations in November. Edward Dana, general manager, said that the road had "turned the corner." Receipts from fares on Dec. 20 were $126,844, the greatest in the history of the road. Wage increases granted recently were said to have been more than offset by reductions in the working force and economies in purchase and operations.

Will Cease Operations.—The Nassau County Railway, operating between the Long Island Railroad station at Sea Cliff and Sea Cliff village, notified the Public Service Commission on Dec. 22 that it will cease operation on Jan. 8. Arrangements are under way between the company and the Sea Cliff authorities for a bus service.

Trolley Line Gives Up.—The Warren-Bristol line of the United Electric Railways, Providence, suspended service on Nov. 23 and simultaneously a bus line was started. Three buses will be maintained during normal service and a fourth added during the rush hour.

Earnings Lower.—The gross earnings of the railway department of the Cumberland County Power & Light Company, Portland, Me., for eleven months of this year are $117,191 less than for a similar period last year. The November gross earnings of the railway department were $110,408 compared with $121,449 during the similar month of 1923. The decline in gross earnings is due, it is said, to the use of the automobile.

Employees All Stockholders.—C. H. Harvey, president and general manager of the Knoxville Power & Light Company, Knoxville, Tenn., recently announced that every employee was a company stockholder. Stock of the company paying a 7 per cent dividend was opened to public subscription on Sept. 1.

Leaves Directorates.—Colonel Sheldon Potter has submitted his resignation as city director of the Philadelphia Rapid Transit Company, Philadelphia, Pa. The two other representatives of the city on the board are Mayor Kendrick and Ernest Trigg.

Personal Items

Wisconsin Officials Take on New Duties

S. B. Way, vice-president Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has been named president of the Peninsular Power Company, which was recently acquired by the North American Company. A. K. Ellis, general manager of the Wisconsin Traction, Light, Heat & Power Company, Appleton, Wis., was named vice-president in charge of operations in addition to his duties with the Appleton properties.

For practically 25 years Mr. Way has been connected with the public utility business and during all that time he has been associated with the interests of the North American Company. Seven years ago he became vice-president and general manager of the Milwaukee property. At one time he had been actively engaged in the management of the Wisconsin Gas & Electric Company, the Watertown Gas & Electric Company, Burlington Electric Light & Power Company and other important utilities in Wisconsin.

A. K. Ellis, who has been named vice-president, was for many years secretary-treasurer and general superintendent of the Wisconsin Traction, Light, Heat & Power Company. He was made general manager in the summer of 1923. The properties recently acquired by the North American Company serve a number of communities in Wisconsin and northern Michigan, including Crystal Falls, Iron Mountain and Iron River.

H. V. Bozell Joins Bonbright & Company

Harold V. Bozell, for the past two and a half years co-editor of *Electrical World* with W. H. Onken, Jr., has resigned, effective Jan. 1, 1925, to join Bonbright & Company, Inc., New York, investment bankers dealing almost exclusively in bonds and preferred stocks of electric light and power companies. During his five years with the McGraw-Hill Company Mr. Bozell has been co-editor of the ELECTRIC RAILWAY JOURNAL, editor of *Bus Transportation* and co-editor of the *Electrical World*.

Mr. Bozell's work with Bonbright & Company will be largely advisory, covering utility operations and technical matters, and his appointment represents an expansion of Bonbright & Company in the direction of maintaining more intimate contact with the light and power industry.

After his graduation from the University of Kansas, his native state, in 1908, Mr. Bozell spent nine years at the University of Oklahoma, where, as a professor, consulting engineer and secretary of the Oklahoma Utilities Association, he was very active in promoting technical education and public interests generally in the state. His good work there resulted in his becoming assistant professor at Yale University in 1917 and continuing in that position until he joined the McGraw-Hill staff. At Yale he developed graduate courses in public utility management and finance.

Mr. Bozell has been very active in association affairs. He takes with him to his new work the best wishes of his many friends, including those of his associates in the McGraw-Hill Company.

C. Henry Dahl Promoted at Winnipeg

C. Henry Dahl has been appointed assistant general manager of the Winnipeg Electric Company, Winnipeg, Man. For the past twelve months Mr. Dahl has occupied the position as assistant manager, and prior to that time was statistician for the company. In his new position Mr. Dahl will have charge of the operating of the railway, electric and gas utilities, as well as the electric and railway business of the two subsidiary companies — the Suburban Rapid Transit Company and the Winnipeg, Selkirk & Lake Winnipeg Railway.

C. H. Dahl

Mr. Dahl is a graduate of the University of Wisconsin, where he specialized in railway transportation, public utilities, statistics, money, banking and other political economy courses. From 1917 to 1919 he worked for the Wisconsin Railroad Commission as case investigator in public utility cases. He joined the Winnipeg Electric Company as statistician in November, 1919, and in less than four years was made assistant to the vice-president. Later in 1923 he assumed the duties of assistant manager of the operating department.

Mr. Dahl's appointment follows the retirement of John Whitsell as operating manager of the company.

E. V. Caton, formerly electrical engineer, has been appointed manager of the light and power department.

All Mr. Dahl's Time to Brooklyn Company's Problems

Gerhard M. Dahl, chairman of the board of the Brooklyn-Manhattan Transit Corporation, will hereafter devote his entire time to the affairs of that company. When Mr. Dahl became chairman of the corporation more than a year ago, he expected to devote only a part of his time to its affairs. The transit problems of Greater New York, however, during the past 18 months have become so important and absorbing that he has decided to devote all his time after Jan. 1 to the corporation in the hopes that he may be of service to the community in the further development of adequate rapid transit. He is retiring from the firm of Hayden, Stone & Company. His retirement from the firm, while a loss to it and a financial sacrifice by Mr. Dahl, will, of course, make it possible for him to carry out his plans—a work that Mr. Dahl's business associates believe will be of great value to the community. As they see it, both from the standpoint of civic benefit and business progress, the transit problems must be solved.

For more than two years now Mr. Dahl has devoted practically all of his time to this question and he has built up confidence in his ability and in his policies. On the occasion of his election as chairman of the executive committee Mr. Dahl said that he assumed the city officials would endeavor to co-operate with the officers of the company to the end that transit conditions might be improved. As for the public, his attitude has been to use all of the present resources of the company to improve the service and to satisfy the public as nearly as it is humanly possible to do so.

Charles Hayden has been elected to the board of directors and the executive committee of the railway.

John Whitsell Retires

John Whitsell, operating manager of the Winnipeg Electric Company, Winnipeg, Man., since 1921, has retired from the railway field and gone to California with his family. His career did not begin with his assumption of duties as manager of the Winnipeg property, for it was in 1891 that he entered upon his utility work. In that year he joined the forces in the car service department of the Sioux City Traction Company, Sioux City, Iowa, now known as the Sioux City Service Company. Six years later Mr. Whitsell served on the Suburban Railroad, Chicago, as a shopman, later advancing to master mechanic and superintendent. When the County Traction Company, Chicago, combined with the Suburban Railroad to make the Chicago & West Towns Railway he was made general superintendent. At the time he went to Winnipeg he was general superintendent of the Chicago & Interurban Traction Company.

Charles H. Allen of Stone & Webster, Boston, has been appointed to a new position, comptroller Chicago Surface Lines, created by the board of operation. He will have entire charge of the financial affairs of the company.

J. P. Hudson has been appointed auditor of the Niagara, St. Catharines & Toronto Railway, effective Dec. 1, 1924. His headquarters will be at St. Catharines, Ont.

F. R. Harrington is secretary and treasurer of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., and W. J. Raidt is auditor. These duties were formerly performed by J. R. Abercrombie. D. C. McClure has succeeded R. W. Curran as general superintendent and purchasing agent.

E. W. Allen is the new engineering assistant for Francis C. Pratt, recently appointed vice-president in charge of manufacturing of the General Electric Company, Schenectady, N. Y. Mr. Allen was appointed manager of the engineering department of the company in April, 1924. He entered the employ of the company in January, 1901, in the test department in Schenectady. He was appointed engineer of the Chicago district in September, 1911, and was made assistant district manager a few years later in addition to his duties as district engineer.

Joseph A. Clair, for many years with the New York Railways, New York City, but more recently with the Yellow Cab Company, has been appointed claim agent of the Fifth Avenue Coach Company, New York. Mr. Clair entered railway work with the Eighth Avenue Railway, New York, in 1898 as a conductor. He pushed forward through the position of starter, inspector, assistant superintendent and general inspector for the superintendent of transportation of the New York Railways organization. In 1910 he joined the legal department of the New York Railways as transfer expert. Later he was made chief investigator, in which capacity he continued until February, 1923, when he took charge of the credit department of the Yellow Cab Company sales agency.

John O. Williams, depot master at the Halsey Street depot of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., has been appointed acting division superintendent of that depot. Mr. Williams' appointment follows the transfer of Division Superintendent R. A. Masters to the Fresh Pond depot, to take the place left vacant by the death recently of Division Superintendent Frederick J. Frey. Mr. Williams has been in the service of the Brooklyn company for more than thirty years.

H. F. T. Erben has been appointed assistant vice-president on the staff of Francis C. Pratt, vice-president in charge of manufacturing and chairman of the manufacturing committee of the General Electric Company, Schenectady, N. Y. Mr. Erben will continue as vice-chairman of the manufacturing committee. He has been identified with the General Electric Company since its early days. During 1914 he was made engineer of the Schenectady works and in March, 1916, was appointed assistant manager. Following Mr. Emmons' retirement as works manager in 1920, Mr. Erben assumed full charge of the works as manager, a position which he held until Jan. 1, 1923, when C. E. Eveleth was made works manager.

Obituary

Walter E. Harrington

Walter E. Harrington, for many years active in electric railway operation and recently consulting engineer in New York, died Dec. 12 at the age of 58. He was graduated from the University of Pennsylvania in 1887 and from 1896 to 1904 was vice-president and general manager of the Camden & Suburban Railway. After the lease of this railway to the Public Service Corporation of New Jersey Mr. Harrington was connected with the operating department of J. G. White & Company, New York, and later was president and general manager of the Eastern Pennsylvania Railways, Pottsville, Pa. In 1904-05 Mr. Harrington was a member of the executive committee of the American Street Railway Association. He also served on several association committees.

Frank Dabney, manager of the Puget Sound Power & Light Securities Company, of the Stone & Webster organization, and a notable figure in Seattle's business and community life, died in Seattle on Dec. 12, following a short illness contracted immediately upon his return from an extended Eastern business trip. Mr. Dabney went to Seattle in 1900 with the Stone & Webster organization. Years ago, when the Stone & Webster interests owned and operated the railway lines in Seattle, Mr. Dabney was named assistant treasurer. At that time the company was known as the Seattle Electric Company. This position, as well as that of manager of the Puget Sound Power & Light Securities Company, he held up to the day of his death. He was also assistant treasurer of the Diamond Ice Company and the Renton Coal Company, subsidiary companies of the Puget Sound Power & Light Company. Mr. Dabney was born in 1853 at Fayal, Azore Islands, where his father was American vice-consul. After obtaining his early education at Fayal and Boston, including a course at the Massachusetts Institute of Technology, Mr. Dabney entered the foreign shipping business. Later, for a time, he was identified with coal mining, timber and railroad interests in Ohio and elsewhere.

Thomas Benton Clawson, one of the organizers and the first president of the Warren Street Railway and the Warren-Jamestown Street Railway, Warren, Pa., died at his home in Warren Dec. 11. He was 79 years old.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Official Washington Sees Good Business Ahead

Public psychology is now inclining strongly toward an expansion of business. There is economic confidence and optimism everywhere. We may expect an active year in all lines of business during 1925. These are thoughts expressed by a high official in Washington.

Some think that we are at the beginning of an inflation movement. Official Washington is watching this very carefully for it was commented that this country cannot go through another cycle of inflation and deflation without wrecking some of the public organizations, and the Federal Reserve system would probably be the first. Thus no real inflation is likely to be allowed to go beyond the early stages.

There is also the further suggestion that we will not have any inflation because that does not come until after there has been total employment for a considerable period. We are not yet up to full capacity in our production and there is still a surplus of labor. The New York Stock Exchange was observed to be distinctly not an indicator fundamentally of business conditions. The recent sustained upward trend of the market was attributed, in the first instance, to the election, but beyond that to the fact that wealthy people cannot afford to sell their stocks at the present large profits on account of the necessity to show these profits in their income tax statement this year. This has caused a shortage of supply of stocks, which has tended to keep the market up.

In view of the great interest which has been shown by business and the public generally in the special studies made by the Department of Commerce in Washington, it may be said that the average of intelligence with respect to business matters generally is showing a distinct advancement. The Secretary of Commerce recently said, in commenting upon this, that "If we can develop in our people a high sense of

Metal, Coal and Material Prices

Metals—New York	Dec. 23, 1924
Copper, electrolytic, cents per lb	14.85
Copper wire base, cents per lb	16.875
Lead, cents per lb	9.60
Zinc, cents per lb	8.02
Tin, Straits, cents per lb	58 02
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.125
Somerset mine run, Boston, net tons	2.15
Pittsburgh mine run, Pittsburgh, net tons	1.875
Franklin, Ill., screenings, Chicago, net tons	1.775
Central, Ill., screenings, Chicago, net tons	1.75
Kansas screenings, Kansas City, net tons	2.30
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.75
Weatherproof wire base, N.Y., cents per lb.	18.25
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N. Y., per gal.	$1.16
White lead in oil (100-lb. keg), N. Y., cents per lb., carload lots	0.157
Turpentine (bbl. lots), N. Y., per gal.	0.84

economic understanding, we would rid ourselves of a large part of the problems that daily confront us." Such general understanding of economics will certainly tend toward governmental as well as economic stability.

Two New Interlocking Plants

The Interborough Rapid Transit Company has placed an order with the Union Switch & Signal Company for the materials required to install an electro-pneumatic interlocking plant at 149th Street, New York City. The machine will be of the Model 14 type, having 24 working and 3 spare levers, equipped with lever lights on all switch levers. Electro-pneumatic high and dwarf signals will be used to direct traffic in the interlocked area, the switches being operated by a total of 16 switch and lock movements equipped with style "C" cut-off switch valves. These materials will be installed by the Interborough company's regular signal construction forces.

Another important installation will be made by the Union Switch & Signal Company on the Boston Elevated Railway, Boston, which has ordered materials for the installation of an electro-pneumatic interlocking plant at Tower "F," Dudley Street. All electric energy employed at this plant will be alternating current. The layout embraces 20 color light signals and 14 switches to be controlled from the interlocking machine, which will have 15 working levers. A track model having 47 lights is being provided to indicate to the towerman the occupancy by trains of the tracks through the plant and in the territory south to Eggleston Square station and north to Dover Street Station.

Laconia Car Company Has Lower Profit

For the year ended Sept. 30, 1924, the net income of the Laconia Car Company, Boston, Mass., after interest charges was $4,753, against $237,254 in the preceding year ended Sept. 30. The total income amounted to $5,710 for the fiscal year ended Sept. 30, this year, compared with $313,615 for a similar period of 1923. Current assets at Sept. 30, 1924, amounted to $839,822 and current liabillities were $34,871, leaving a net working capital of $804,951. This item last year was $678,596.

Rolling Stock

New York Central Railroad, New York, N. Y., has ordered seven electric switching engines and two electric freight locomotives from the General Electric Company.

Atlantic Coast Railway, Asbury Park, N. J., through the Atlantic Coast Transportation Company, a subsidiary, has purchased 17 new buses to be used along the New Jersey coast cities.

Lewisburg & Ronceverte Electric Railway, Lewisburg, W. Va., according to R. M. Bell, general manager, is planning for the purchase of a gasoline motor car which will be used for freight service.

New York State Railways, Syracuse, N. Y., expects to buy four more buses for relief purposes. A number of motor trucks will also be purchased for the establishment of a freight service between Syracuse and cities within a radius of 100 miles.

Track and Line

Pennsylvania Railroad, New York, N. Y., has been ordered by the Board of Public Utility Commissioners of New Jersey to provide a switch connection between its tracks and the proposed carhouse and shops of the Trenton & Mercer County Traction Corporation, Trenton, N. J. The railroad refused to lay the switch, claiming that it had leased ground there to a lumber company.

Southern Public Utilities Company, Charlotte, N. C., is rebuilding ¾ mile of track on Belmont Avenue incident to the paving of that street.

Municipal Railway of San Francisco, San Francisco, Cal., has been authorized by the Board of Public Works to launch the $500,000 Judah Street extension. The board has authorized immediate improvement of 10 blocks on Judah Street between Thirty-first and Forty-first Avenues in preparation for laying tracks from the ocean along Judah Street to Cole and Carl Streets. This extension will connect with Market Street by way of the Eureka Valley-Sunset Mission tunnel.

Power Houses, Shops and Buildings

Columbus Railway, Power & Light Company, Columbus, Ohio, is having plans drawn for a three-story repair and service building to cost $300,000, with machinery and equipment. It will be devoted to the repair of rolling stock, company automobiles, service cars and trucks.

New York, N. Y. — The Board of Transportation recently awarded to the Lustbader Construction Company, Inc., the contract for the construction of the foundations, retaining walls and embankment for the Corona Storage Yards on the Flushing subway at Hewitt Avenue and Riverside Avenue, Corona. The contract was for $235,934, which was the lowest bid received. The yards are designed to accommodate 200 cars of either the Interborough or B.-M. T. type. When completed the yards will have capacity for 700 cars, in addition to space for inspection sheds. The yards cover an area of twenty acres and under the terms of the contract will have to be ready for occupancy within a year.

Trade Notes

Stockbridge Machine Company, Worcester, Mass., has appointed the following direct sales representatives in their respective territories: D. J. Normoyle and Starr Equipment Company, in the Liberty Building, Philadelphia, Pa.; A. B. Starr in the Anott Building, Pittsburgh, Pa.; D. E. Morand Machinery Company, at 8784 Quincy Avenue, Detroit, Mich.

Norma-Hoffmann Bearings Corporation, New York, N. Y., has moved its factory and general offices to its new plant at Stamford, Conn. The Long Island City office has been discontinued and all shipments will now be made from the Stamford plant.

O. M. Bostwick has resigned as New York representative of the publicity department of the General Electric Company and will probably resume his activities in the technical publicity field in New York City.

New Advertising Literature

Roller-Smith Company, New York, N Y., has issued Bulletin No. 530 illustrating and describing its new double-pole "interlocked trip" breakers and its new "shock-proof" circuit breaker. Data are included pertaining to different types of circuit breakers for different applications.

General Electric Company, Schenectady, N. Y., has issued Bulletin No. 48732, "Electric Equipment for Cranes." This is an attractive 35-page leaflet, well illustrated with photographs, diagrams, tables and charts. It discusses the subject thoroughly, with particular reference to crane motors, control and brakes. Information is given on operating characteristics, and types of standard motors are listed in the bulletin.

Crouse Hinds Company, Syracuse, N. Y., has issued folder No. 15 and bulletin No. 2058 describing "Wedgtite" pipe hangers. How pipes are clamped to or suspended from structural shapes is described.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued a new publication called "The Cleveland Railways—The Story of Its Operation and Maintenance." This book was prepared with the cooperation of officials of the railway and describes the entire system. The introductory chapter is headed "The Tayler Plan—Its Evolution and Provisions" and briefly relates the early traction history in Cleveland. Chapter I, "Track and Overhead Systems," describes briefly the practice and policies of the Cleveland system. "The Power System" is the title of Chapter II. This describes in detail the automatic substation practice on this city system, which enjoys the distinction of having used the first large capacity two-unit substations for metropolitan areas. The various types of cars in use at the present time are described in Chapter III, which also contains several paragraphs about the service. The Harvard Shops, which have always caused much comment because of their completeness, are described by departments in Chapter IV. Chapter V is devoted to the operating stations. The entire book is profusely illustrated. Copies of the book, known as Special Publication 1703, may be obtained free of charge from any Westinghouse district office or from the publicity department at East Pittsburgh.

McGraw-Hill Company, Inc. December 27, 1924 Twenty Cents Per Copy

ELECTRIC RAILWAY JOURNAL

Two hundred fifty "Mitten Management" gasoline-electric Yellow Coaches have been ordered by the Philadelphia Rapid Transit Co. to supplement their street car service * * * This is the largest single motor coach order in the history of this new mode of transportation * * * During the past year six hundred Yellow Coaches have been ordered to supplement and extend traction service

YELLOW COACH MANUFACTURING CO.
Austin & Dickens Aves., Chicago, Ill.

Better Public Relations, Better Service and Better Income—Our 1925 Resolution

"Boys!", said Big Bill, the Master Mechanic, "Doughboy Dan, our Transportation Engineer and myself have just left the General Manager's office. He paid all of us a fine compliment for the splendid progress we have made during the year on better Maintenance and Service, and has approved our plans for the coming year, but in addition to that, he wants us to get aboard of the Company's program for Better Public Relations and Increased Revenue. He said that the homes of every one of our men should be a *broadcasting station*, sending out constructive, helpful information about the Company and what we are accomplishing among their neighbors and people with whom they come in contact, and that our Staff Leaders should develop the ability to give talks in their neighborhood before various Civic Associations and Clubs. Doughboy Dan has been assigned the duty of developing this activity in our department. Dan, tell them what your plans are."

Dan stated: "The first thing I suggest is that we read and digest the Westinghouse Co-operative public advertisements that have been put out the last few years, such as '*Jammed*,' '*Street Cars Build Homes*,' '*You Need Street Cars*,' '*The Wheels of Progress Are Under Your Street Cars*,' and the like. These ads are highly educational and informative. Another thing to grapple with is Freight Haulage on our Interurban lines. Westinghouse specialists have been doing a remarkable amount of study and co-operative service on this. Each of us should get a copy of Westinghouse Special Publication No. 1634 on Freight Haulage. I am also going to get our Educational Directors busy on a special course of training on public speaking and the economics of our transportation business."

WESTINGHOUSE 1925 PROGRAM

For Better Maintenance—Better Service—
Better Public Relations,
and Increased Earnings for the Industry

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.
Sales Offices in All Principal American Cities

MEMBER ELECTRICAL EQUIPMENT MANUFACTURERS ASSOCIATION AERA

W WESTINGHOUSE ELECTRIC

Westinghouse

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ELECTRIC RAILWAY JOURNAL

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64th Volume Indexed

WITH the completion of Volume 64 of ELECTRIC RAILWAY JOURNAL this week, covering the last six months of 1924, the index for this volume is bound in as an integral part of this issue. This has been a feature of JOURNAL service for many years. It is well understood by the older subscribers of the paper, who keep the indexes available so as to facilitate reference to the volumes.

For those who bind the JOURNAL in permanent form the index section also provides the title page. It should be placed in the front of the volume. But in any event the index should be kept handy, for its references will be found of value to every subscriber whenever information is needed regarding events or practices chronicled during the past six months.

Reference is made easy by classification of articles by subjects as well as by cities and companies. The principal subjects are classified in a list of key words printed ahead of the alphabetical index. Then, too, articles are cross-indexed so that there are several ways by means of which they may be located quickly.

Number of Copies Printed, 6,250 Advertising Index—Alphabetical, 40; Classified, 36, 38; Searchlight Section, 35

Happy New Year!

May you have smooth track to happiness, may you weld the good-will of your public permanently to your organization, may your daily grind prove profitable—may you thrive in 'twenty-five.

Railway Track-work Co.

3132-48 East Thompson Street, Philadelphia

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Chas. N. Wood Co., Boston
Electrical Engineering & Mfg. Co., Pittsburgh
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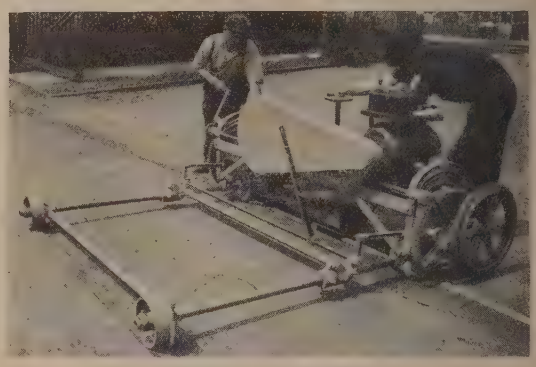
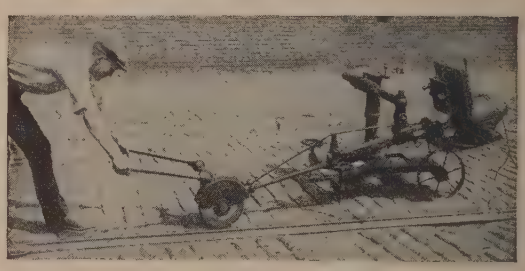
"Reciprocating" Track Grinder

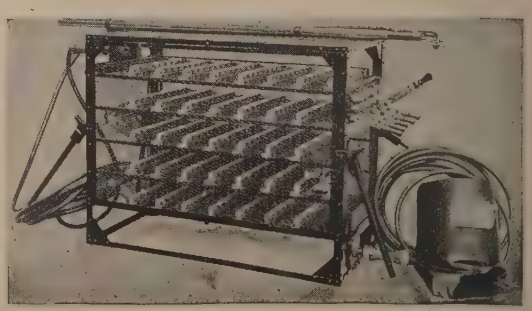


"Vulcan" Rail Joint Grinder

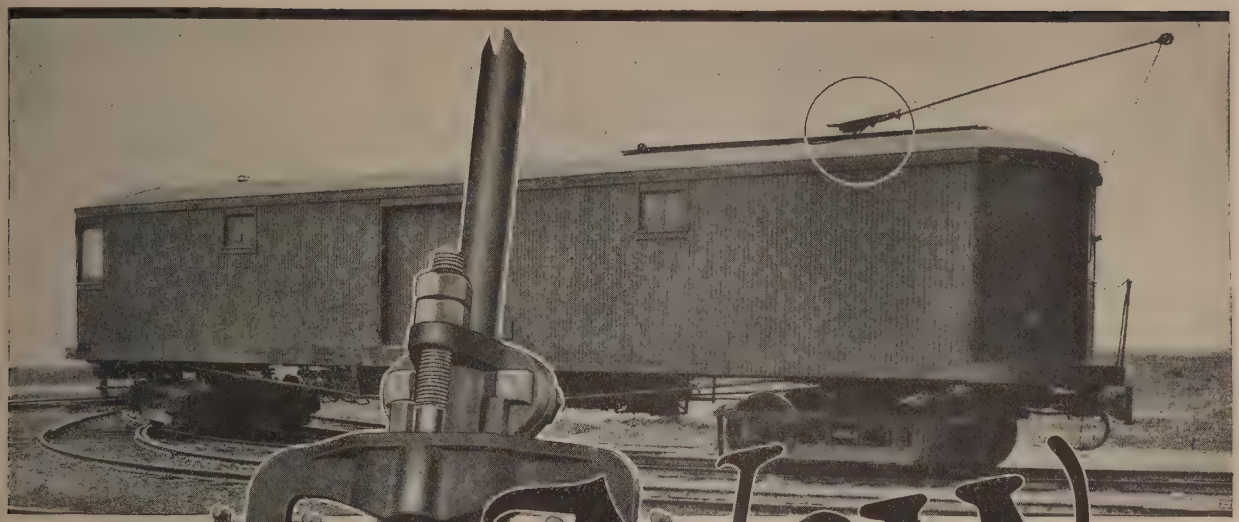
"Atlas" Rail Grinder



"Hercules" Swing Frame Rail Grinder



"Ajax" Electric Arc Welder

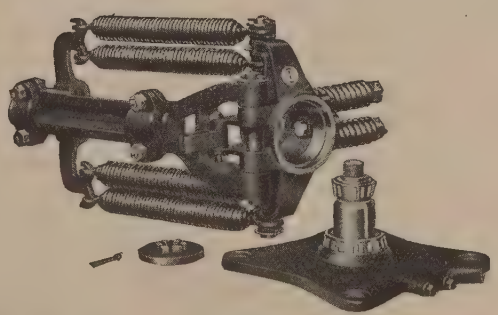


New

An O-B Base with Timken Roller Bearings

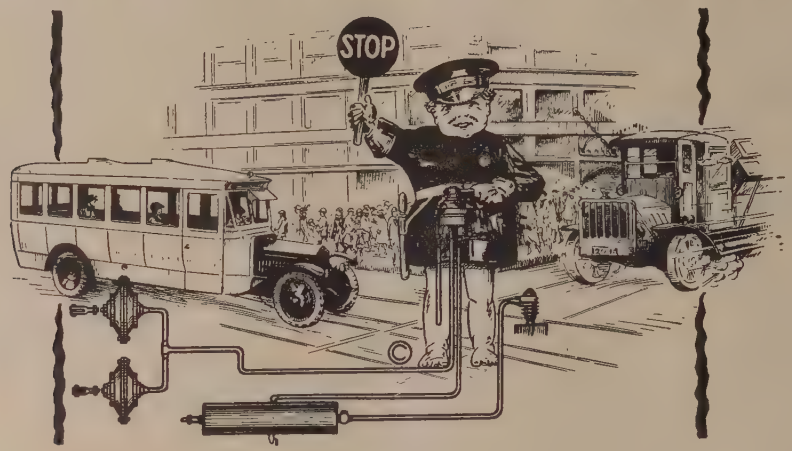
An O-B Trolley Base with standard Timken Roller Bearings is now ready. Bearing housing carries contact brush that shunts current around the bearings. Let us send you complete details.

The Ohio Brass Company
Mansfield, Ohio, U. S. A.



O-B CAR EQUIPMENT

WESTINGHOUSE AUTOMOTIVE AIR BRAKES



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Houston Electric Co.
Los Angeles Ry. Co.
Milwaukee Electric Ry. & Light Co.
Los Angeles Bus Co. (jointly owned by Los Angeles Ry. and Pacific Elec. Ry.)
Monongahela West Penn Public Service Co., Fairmount, W. Va.
Portland Electric Power Co.
Public Service Corp. of New Jersey.
Puget Sound Inter. Ry. & Power Co.
United Electric Railways, Providence, R. I.
San Diego Electric Railway.

You also should install Westinghouse Automotive Air Brakes on the buses you operate, and thus safeguard the riding public, who have learned to depend upon the safety and time-saving assured by the Air Brake.

Westinghouse Traction Brake Company
AUTOMOTIVE DIVISION
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Automotive Air Brakes Sell Transportation

THE FIFTEENTH YEAR

37% More Twin Ties sold than in 1923.

80% Sold to Companies with upwards of 13 years experience with Steel Tie Construction.

20% Sold to new customers.

There is a definite relation between this record year for sales of Steel Twin Ties and Track Costs for initial installation and maintenance on over 147 properties in the United States and Canada.

While the complete presentation of this data in our book, "Steel Tie Track Construction" is persuasive, it is not dangerous.

Expose yourself to it by directing us to mail it to your office or home.

THE INTERNATIONAL STEEL TIE COMPANY
Cleveland, Ohio

Steel Twin Tie Track

Renewable Track · · Permanent Foundation

We Work With Waxes

One of the "streets" in the Mitchell-Rand plant, Jersey City, N. J. Transporting Synthetic Ceresin Wax to the loading platform.

Vast quantities of artificial ceresin are used in the manufacture of pharmaceutical creams, perfumery, paper, polishes, rubber mixtures, paints, wax figures, etc.—an almost endless list.

MITCHELL-RAND MAKES MANY MIXTURES

Animal, Vegetable and Mineral Waxes—gathered from China, Japan, India, Galicia, Saxony, Mexico, Brazil and the Americas—are employed in the manufacture of our insulating and commercial compounds.

Everything in Insulation

MITCHELL-RAND MFG. CO., 15 VESEY STREET NEW YORK, N. Y.

Solving Equipment Puzzles!

WHEN confronted with puzzling problems concerning choice of car equipment — open up your ESSCO CATALOG No. 7. The answer will be found quickly.

In the *Keystone* Line of Car Equipment, you will find the most up-to-date, efficient, and satisfactory materials and devices. Specify them for your new cars. Order them to carry out your modernization program with the older cars.

Some items from

ESSCO CATALOG NO. 7

the Car Equipment Book

Golden Glow Headlights
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RAIL BONDS

Now! Applied by "Gas"

The Long-life, Highly Conductive Copper to Steel Welded UNA Bond is now applied by either the Electric Arc or Gas Flame methods.

The UNA Weld.

No matter which method is used the resulting copper to steel weld is identical. The same bonds and molds are used, the only difference in either method being the source of heat. In one case it's the heat of the carbon arc, in the second case it's the heat of the arc drawn by the metal electrode and in the third case it's the heat of the gas flame (oxy-acetylene).

The UNA Mold.

The UNA Mold positions and holds the bond head against the rail. *It retains the molten metal until the weld forms. The mold not only simplifies the bonding for the welder but also speeds up the process.*

UNA—The Universal Bond.

With one stock of standard UNA Bonds and Molds either of the three methods of Bonding may be used. If electric power is available either of the electric arc methods may be the most suitable. For pickup bonding or if power is not available, the gas flame method will meet your bonding needs.

As the same bonds and molds are used, UNA Bonding offers a *Universal Bonding Method* that economically meets every bonding condition.

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The Exit Doors Are Automatic

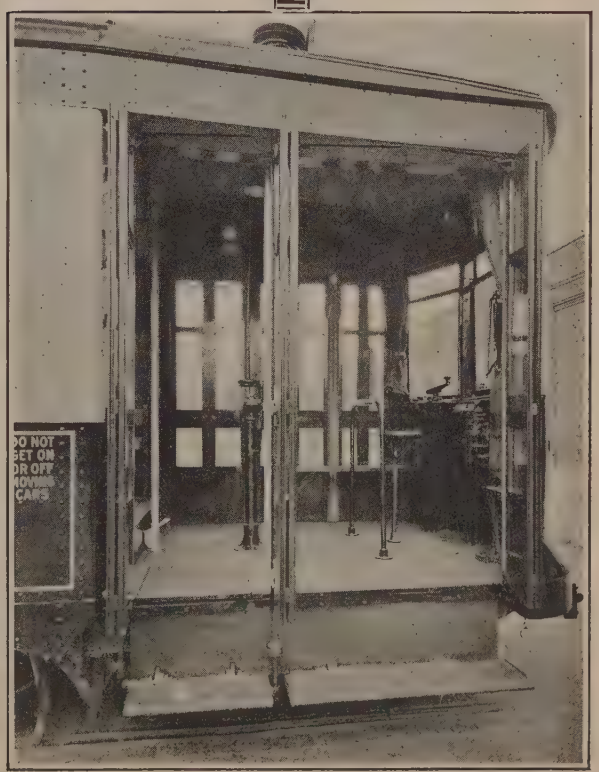
On Chicago's Latest Type Multiple Unit Cars!

Of course
NATIONAL PNEUMATIC DOOR ENGINES
are used

Here's the story!

OVER two years ago, Chicago installed in addition to "Safety Car Devices Equipment," *automatic* doors on 45 double truck one man cars. Today they are putting them on 100 new cars, designed for single and multiple unit operation in congested districts. This is a tribute not alone to the success of the Automatic Door, but also to another successful adaptation of National Pneumatic Equipment.

And furthermore, National Pneumatic Door Equipment is standard in Chicago, as it is in nearly all the leading American cities.



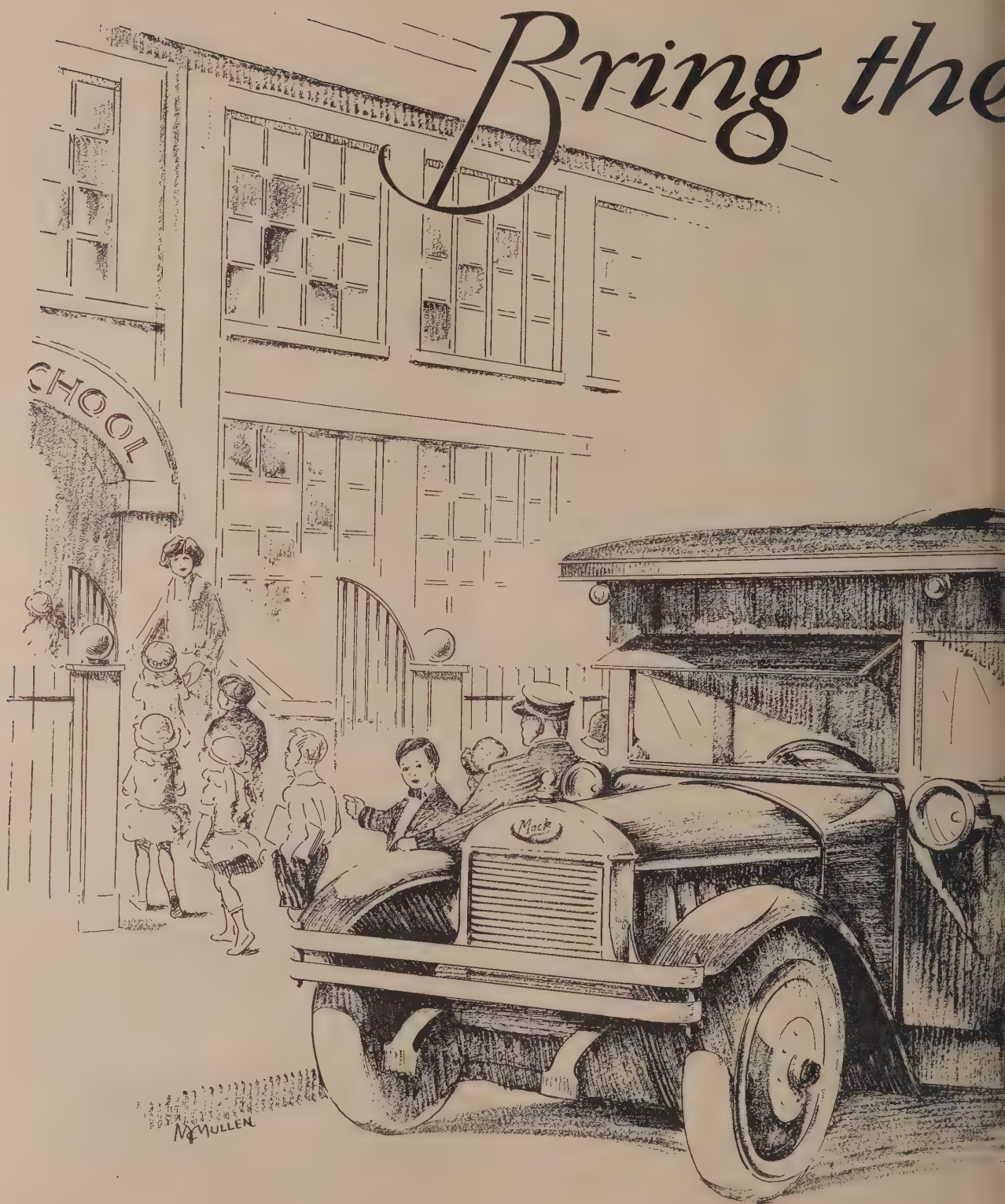
National Pneumatic Co., Inc.

Originators and Manufacturers

***Executive Office:* 50 Church Street, New York**

Philadelphia—1010 Colonial Trust Building
Chicago—940 McCormick Building
General Works—Rahway, New Jersey

Manufactured in Canada by
Dominion Wheel & Foundry Co., Ltd., Toronto, Ont.


Bring the
CHOOL
Mack
McMULLEN

children to school in Mack Buses!

Ask any of the mothers in your community how much thought they have given to the problem of getting the children off to school. They'll tell a story of worry and anxiety.

For in most cases small children can not be allowed to travel alone in crowded cars. Either mother must go along, or the kiddies must walk,— and nine times out of ten the kiddies walk.

How welcome would be a school bus service,— with trusty, safe, dependable Mack Buses? And a driver who would take good care of the little ones from door to door.

Mothers relieved of all anxiety would bless the railway company,— goodwill well worth having. Thousands of children riding, where previously they had walked would mean a substantial increase in fare-box receipts.

All through a comparatively small investment in equipment, which because of its flexibility, could always be used to utmost advantage.

Progressive electric railways are turning more and more to Mack Buses for auxiliary service of this kind. They find in Mack Bus design and exclusive mechanical features, that solid dependability so vital whether the service be taking the kiddies to school, feeding an outlying district, or helping ease congested car lines in busy sections.

From bumper to tail light, the Mack is all bus; — built for utmost efficiency and economy in bus operation.

For example there is the sturdy long-life Mack engine.

The specially designed low bus chassis.

Wide tread assuring safety and pe mitting a short turning radius.

The Mack dual reduction drive axle, especially designed to give maximum road and underbody clearance.

The Mack transmission with ground gears.

Dual system of brakes on rear wheels and drive shafts.

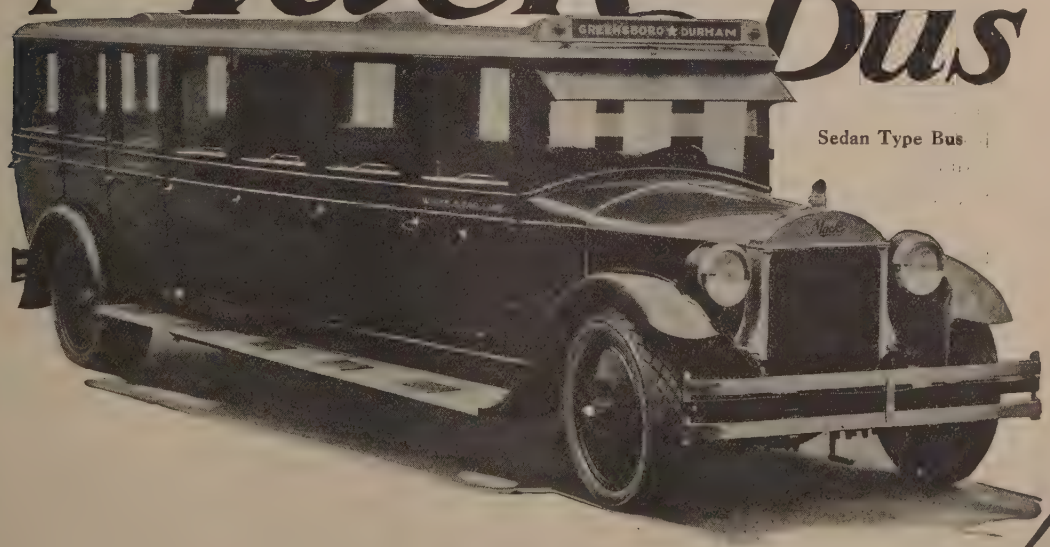
The Mack Shock Insulator. (All spring ends are embedded in rubber shock insulator cushions, assuring ease of riding and less wear.)

The kiddies are doubly safe in a Mack Bus.

MACK TRUCKS, INC.
INTERNATIONAL MOTOR COMPANY
25 BROADWAY NEW YORK CITY

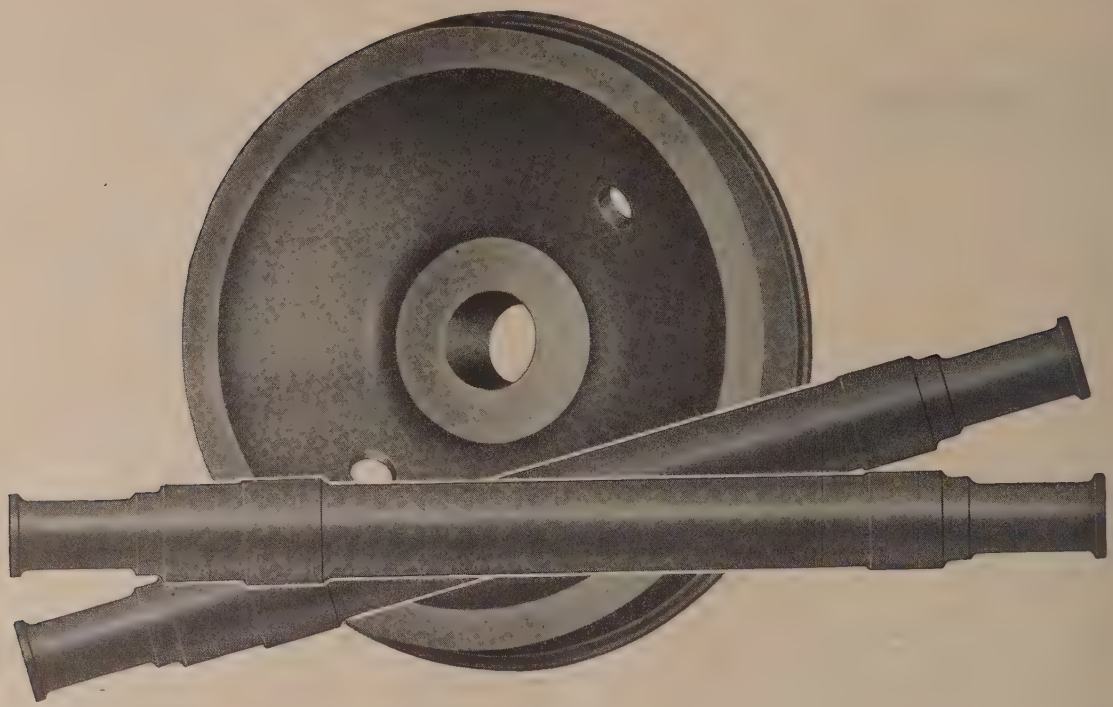
Eighty-three direct MACK factory branches operate under the titles of: "MACK MOTOR TRUCK COMPANY" and "MACK-INTERNATIONAL MOTOR TRUCK CORPORATION."

The Mack Bus



Sedan Type Bus

Performance counts!



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CAMBRIA ROLLED STEEL CAR WHEELS for Electric Service are made at the Johnstown Plant of Bethlehem Steel Company by a combination rolling and forging process. This process thoroughly works the steel and gives an exceptional refinement in structure which does not readily develop flat spots. For this reason Cambria Rolled Steel Car Wheels will give you the longest service at lowest cost.

CAMBRIA FORGED AXLES for Street, Interurban, Subway and Elevated cars, and Armature Shafts for Electric Service are made in the Axle Plant to meet any reasonable specification. They can be furnished treated or untreated; solid or hollow bored; smooth forged only; rough turned all over; rough turned on journals and wheel seats; or finished turned on journals and wheel seats.

We will also mount wheels on the axles if so desired

Specify Cambria Rolled Steel Car Wheels and Forged Axles on your next order.

Large stocks of wheels and axles in standard sizes assure prompt shipment.

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Listen in on Station CCH

This is station CCH, the Consolidated Car Heating Company, broadcasting its usual weekly program to the electric railway industry, direct from its factory, at Albany. This station is operating on a wave length of satisfaction.

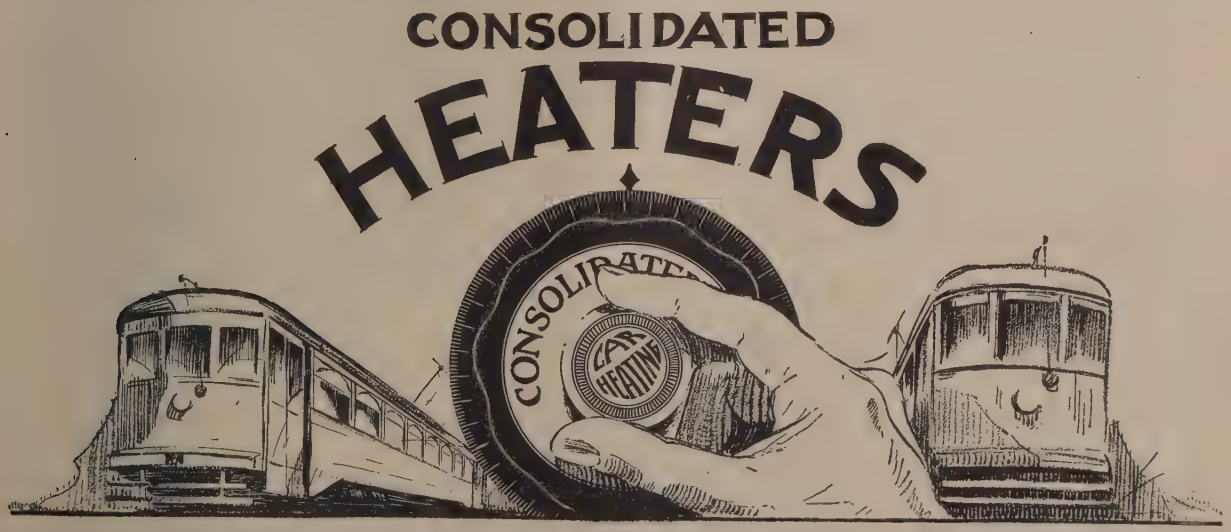
Underwriters approval—
ON CONSOLIDATED ELECTRIC CAR HEATERS

IT MEANS SOMETHING to you to know that **26 different types of Consolidated Electric Car Heaters have been inspected and approved by the Underwriters Laboratories Maintained by the National Board of Fire Underwriters.**

Critical inspection of Consolidated Electric Car Heaters reveals many safety features which inspire confidence. No red-hot wires. Asbestos safety cord through coils binds coils securely to porcelain insulator. Every coil used is accurately measured for electrical resistance. Cases are tamper and fool-proof.

Station CCH now signing off until this time next week when the broadcasting program will be resumed.

Good day!



CONSOLIDATED CAR HEATING COMPANY
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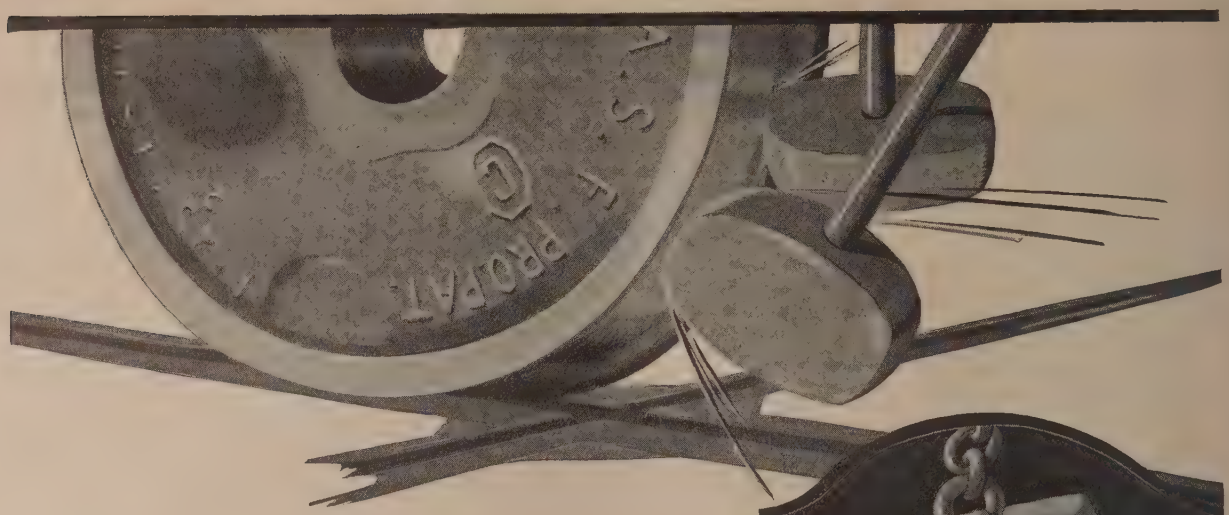

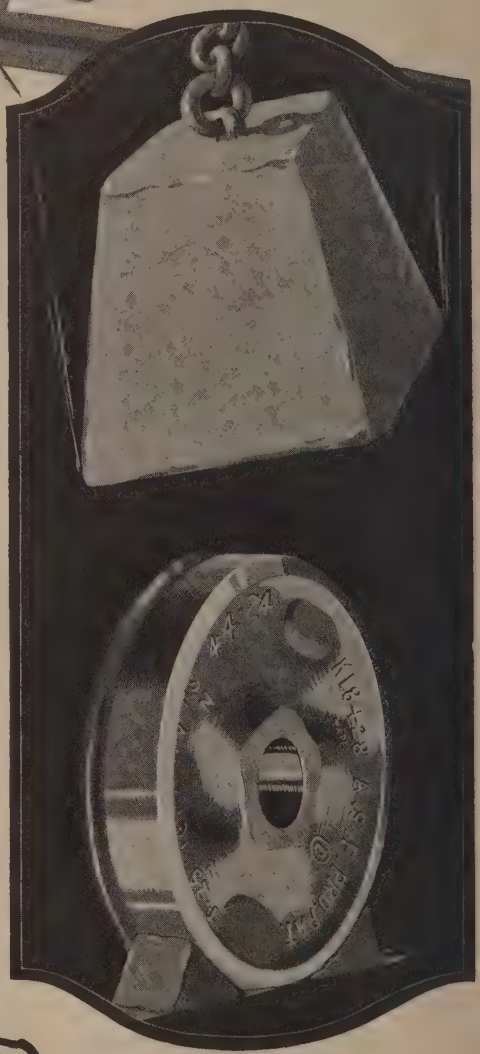

Skull Crackers

Smash! Crash! Bang!

THE hammer blows of the maker's tests are repeated a thousand times a day as car wheels pound over track crossings, over frogs, switches and low joints.

"Skull cracker" is the suggestive name by which this testing equipment is known. Tests on Davis "One-Wear" Steel Wheels made with this instrument of torture show that they are able to withstand the impact and shocks of service, without chipping or cracking, better than any wheel made.

Records of Davis "One-Wear" Steel Wheels in operation on scores of roads back this up in actual service.

American Steel Foundries
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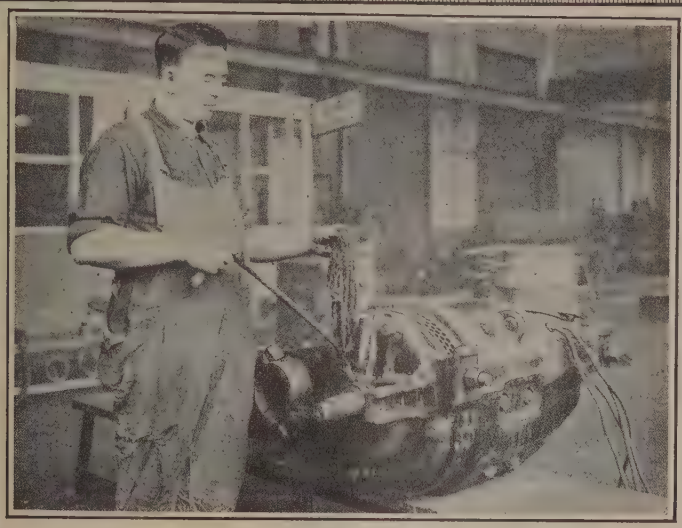
DAVIS
"ONE-WEAR"
STEEL WHEELS

Galena Oils and Service



Doing it right!

How?—When?—Where?—and What?

Four fundamental questions in electric railway lubrication problems!

On the correct answers to these questions and the efficient execution of the policies laid out, depend nearly the whole structure of truck and motor bearing maintenance costs.

Galena Lubrication is more than oil alone. It is oil plus experience plus service. Each of these factors is essential to good results. With the best of oils as a base, Galena applies a lifetime of experience to produce the right lubricant to fit each condition and then through Galena Service insures its proper employment.

Galena Lubrication always results in increased availability of equipment, fewer delays and lowered maintenance cost.

Galena-Signal Oil Company

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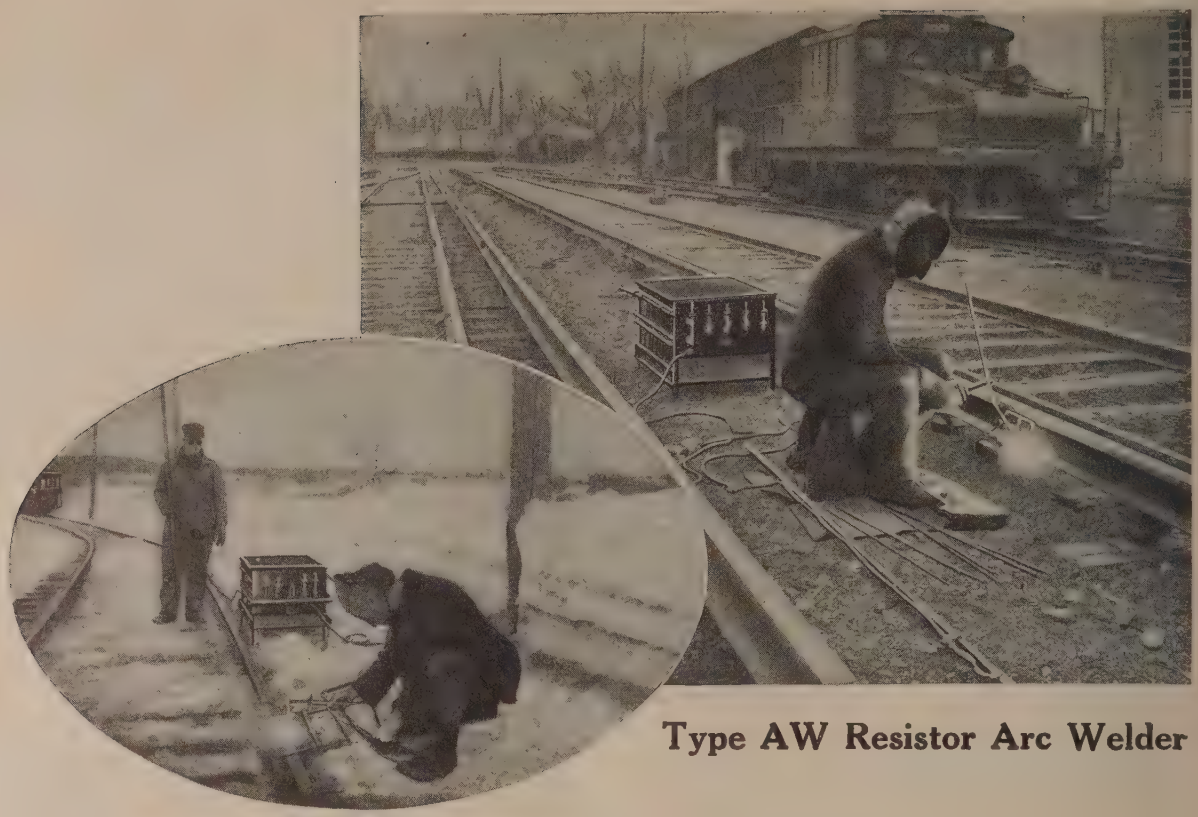
and offices in principal cities



Type AW Resistor Arc Welder

Type AW Arc Welder

—weighs 140 lbs.

—does good work in quick time at minimum cost

—withstands wear of weather

—specially designed for welding rail bonds, fish plates, etc.

—operates on 400/650 volts, and welding current can be varied by 15 ampere steps to 60 to 200 amperes.

Ask the G-E sales office nearest you for complete information on your electric welding requirements.

General Electric Company
Schenectady, N. Y.
Sales Offices in all Large Cities

"It recommended itself on account of its lightness"

—writes a user of the AW Arc Welder. "It is the lightest machine for doing this type of work that we know of, and for the use to which we put it this lightness is a distinct advantage on account of the number of set-ups per day over a considerable stretch of track.

"It has been in service about a year and has performed its work very satisfactorily. We use it on maintenance work where the bonds to be applied are more or less scattered—and with two men put on 60 to 70 bonds per day."

Just hook the Type AW Arc Welder to a trolley wire and you get service that satisfies.

Light weight—easily handled

43B-883

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PEACOCK
Staffless Brakes

Reasons why Peacock is preferred—

Maximum Braking Power
Ample Chain Winding Capacity
Least Platform Space
Simple Operation
Unfailing Reliability
Low Maintenance Costs

You'll find them all Important

Nearly quarter of a century building and installing hand brakes has established beyond question, the safety and reliability, the long satisfactory life and low maintenance costs of Peacock Brakes.

Due to their correct construction of properly selected materials, Peacock Brakes involve practically no expense for repairs and replacements.

The rapidity with which a Peacock Staffless Brake will bring a speeding car to a dead stop inspires confidence on the part of the motorman because he knows after a few trials that he can depend on the Peacock in emergencies.

Our engineers have specialized on the design of hand brakes and they have considered the problem from all angles. Peacock Brakes are specified by experts in rolling stock who do not depend on some one else's say so.

Peacock Brakes are designed with the "*safety* first" idea.

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Chicago Surface Lines' last 100 cars, soon to go into service, have Haskelite roofs, truss planking and bulkheads. In every location it saves weight, increases strength and improves appearance. Reduced weight lowers the center of gravity, improves riding qualities and lessens operating costs as much as $50 per year.

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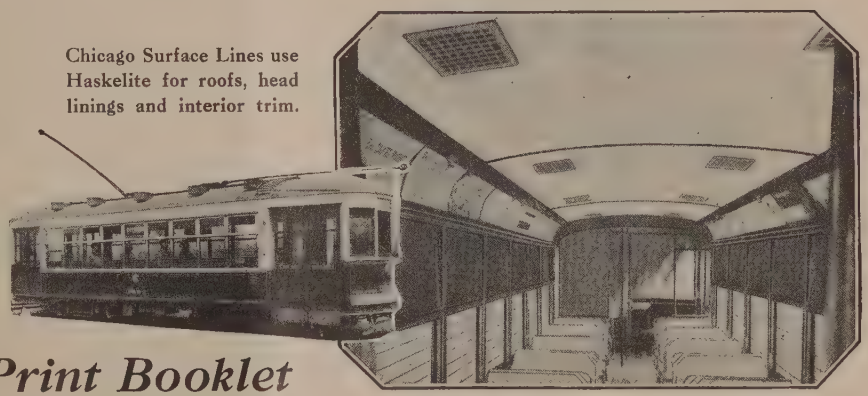
Is Haskelite with steel faces, making superior side panels, vestibule linings and letter boards. Besides being very durable, it posesses great heat insulating value and deadens sound. Resisting indentation, it is easier to keep in good condition than steel.

Chicago Surface Lines use Haskelite for roofs, head linings and interior trim.



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A nation-wide organization building and sustaining car cardadvertising space values

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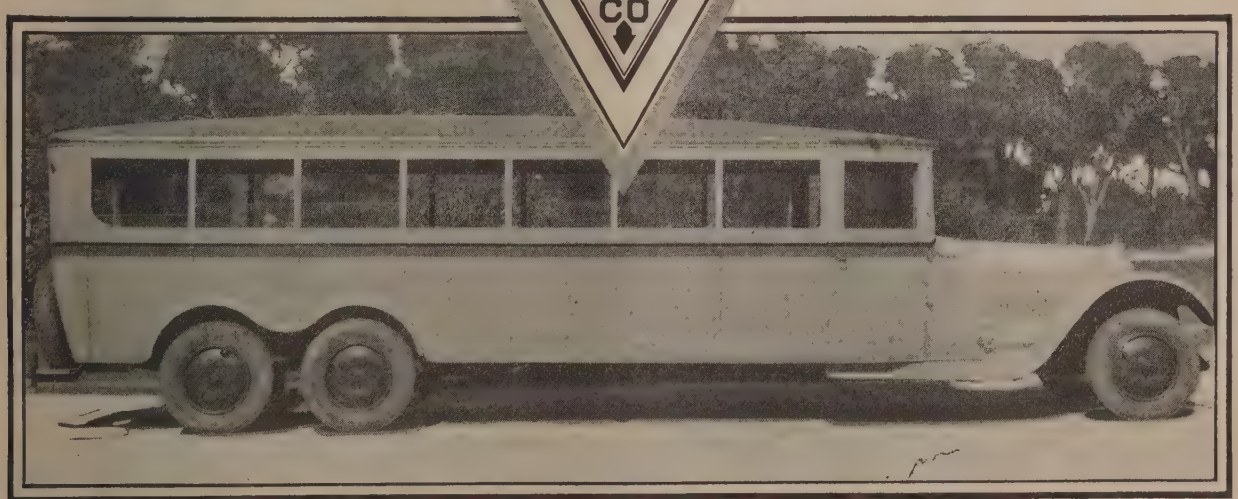
A Year of Progress—

Many interesting developments, many improvements in motor coach designing, have marked the calendar year now drawing to a close.

Timken-Detroit has participated in —and contributed to—this progress. Therefore, although the advanced types of motor bus differ in many respects, they agree in one—that their axles are built by this company.

THE TIMKEN-DETROIT
AXLE COMPANY
Detroit, Michigan



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NON-ROT SHELTERS

Tide Water Cypress "The Wood Eternal"

& NON-ROT PLATFORMS built of Tide Water Cypress "The Wood Eternal" are a very valuable contribution toward *Economy Records*.

Economy Records figured over a period of years gain more by the *avoidance of repairs and replacements* than they can by any minor shaving of the original cost. True *"Tidewater" Cypress*, the only "Wood Eternal," is coming into its own as the ideal light structural lumber for *Railway Uses*.

We recommend Cypress only for the applications in which it excels.

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Identify "Tidewater" Cypress by the Arrow Trade-Mark.

Some One Wants To Buy

the equipment or machinery that you are not using. This may be occupying valuable space, collecting dust, rust and hard knocks in your shops and yards.

Sell it

before depreciation scraps it.

The Searchlight Section is helping others—
Let it help you also

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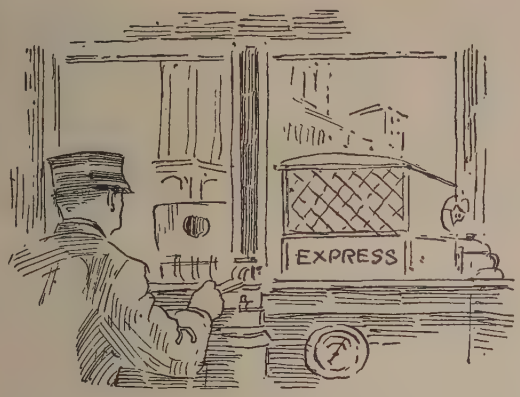

Is a noiseless, vibrationless gear possible?

Nuttall Helical Gear and Pinion

You have had visions of a gear — a quiet, smooth acting gear that would work without constantly jarring loose nuts, bearings, insulation and generally shortening the life of the motor and even the car itself.

This ideal has been realized in the Nuttall Helical Gear. This gear is virtually noiseless. It has been proven to be the smoothest, quietest and most enduring type of gear that can possibly be made.

If you really want noiseless cars and less maintenance work, investigate Nuttall Helical Gears. Our Gear book tells you all about them. Write for it.

R.D. NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

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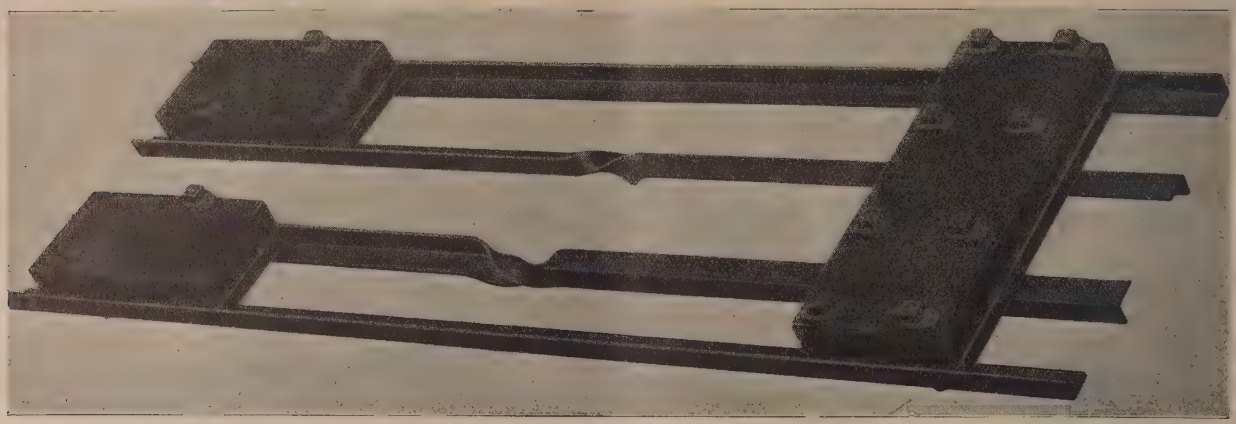

Joint Tie

Strengthen the joint and you get rid of many track troubles. The Dayton Resilient Joint Tie is designed to give additional strength to the most vulnerable part of the track, by supporting both rails on the same level and preventing battered and sunken rail joints.

Welding the rail to the top plate of the tie provides excellent current return. No other bonding necessary.

Thousands of these Joint Ties are in use. Write us.

The Dayton Mechanical Tie Co., 707 Commercial Building, Dayton, Ohio

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Your Passengers Will Enjoy Their Ride On

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Especially Designed for
One Man Safety Cars

Lightest Weight Stationary Steel Seat

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The illustration shows one of the twenty-five new Peter Witt type cars now being delivered to the Detroit Municipal Railways, equipped with St. Louis equalized trucks.

St. Louis "Quality Built" cars are used by the principal electric railways throughout the U. S. Every car is built with the same high quality of workmanship.

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Quality **St. Louis Car Company** Safety

St. Louis, Mo.

"The Birthplace of the Safety Car"

Quick Accurate Permanent

A Record of Each Sale When the Sale is Made

The sale of electric railway transportation is strictly a retail business proposition and should comply with those methods which have been found most successful in other lines of merchandising.

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Ohmer Fare Registers indicate and record the exact amount and class of fare paid at the time it is paid. They apply to electric railroading the correct methods which have brought success to countless retail merchants.

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Dayton, Ohio, U. S. A.

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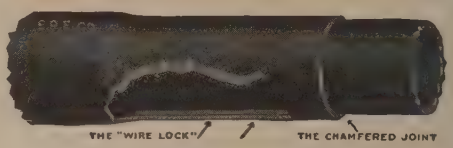

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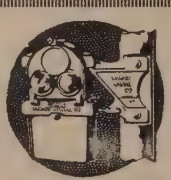

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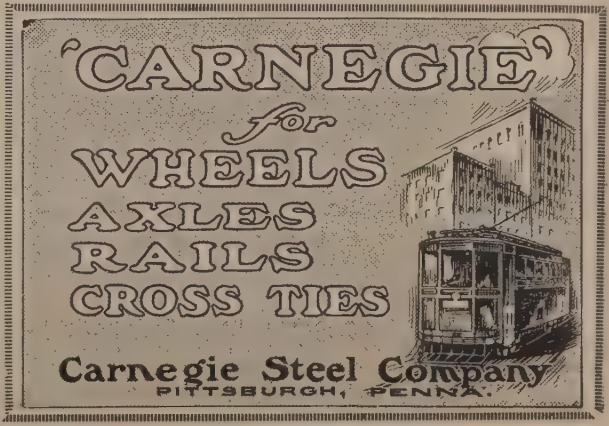

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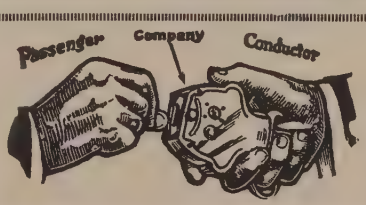

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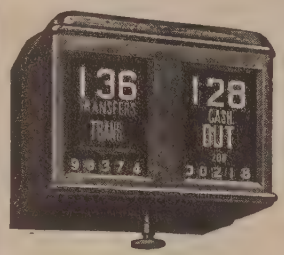

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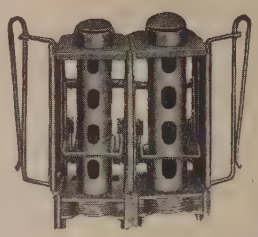

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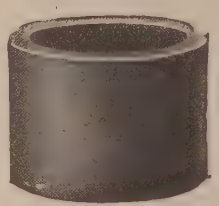

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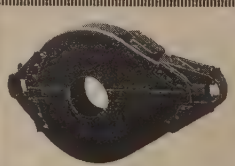

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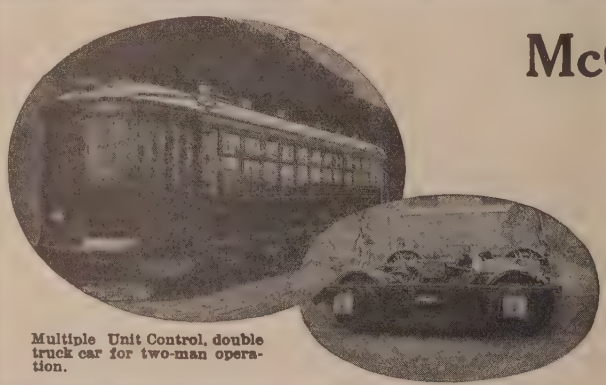

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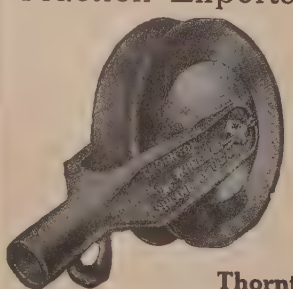
Snow Sweepers

Traction Experts Sing the Praise of THORNTON Trolley Wheels



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Strong-tough-durable
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Ready for operation
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1 TON OR 1000
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SPLICE BARS
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All Rails and Track Materials shipped subject to inspection and approval at destination.
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Timken-Detroit Axle Co.

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International Register Co., The

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Brill Co., The J. G.
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Elec. Service Suplies Co.
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Norma-Hoffman Bearings Corp.

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Babcock & Wilcox Co.

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Brill Co., The J. G.
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St. Louis Car Co.

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Archbold-Brady Co.

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General Electric Co.
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Intern'l Register Co.
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Coin Sorting Machines
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Crossings, Track (See Track, Special Work)

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Johns-Pratt Co.
Superheaters
Babcock & Wilcox Co.
Sweepers, Snow (See Snow Plows, Sweepers and Brooms)
Switches, Safety
Johns-Pratt Co.
Switches, Selector
Nichols-Lintern Co.
Switches, Tee Rail
Ramapo Ajax Corp.
Switches, Track (See Track Special Work)
Switches and Switchboards
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
Tamper Tie
Ingersoll-Rand Co.
Railway Track-work Co.
Tapes and Cloths (See Insulating Cloth, Paper and Tape)
Tee Rail Special Track Work
Bethlehem Steel Co.
Ramapo Ajax Corp.
Telephones and Parts
Elec. Service Supplies Co.
Terminals, Cable
Std. Underground Cable Co.
Testing Instruments (See Instruments, Electrical Measuring, Testing, etc.)
Thermostats
Consolidated Car Heat. Co.
Gold Car Heat. & Ltg. Co.
Railway Utility Co.
Smith Heater Co., Peter
Ticket Choppers & Destroyers
Elec. Service Supplies Co.
Ties, Mechanical
Dayton Mechanical Tie Co.
Ties and Tie Rods, Steel
Barbour-Stockwell Co.
Carnegie Steel Co.
International Steel Tie Co.
Ties, Wood Cross (See Poles, Ties, Posts, etc.)
Tool Steel
Bethlehem Steel Co.
Tools, Track & Miscellaneous
Amer. Steel & Wire Co.
Elec. Service Supplies Co.
Hubbard & Co.
Railway Track-work Co.
Torches, Acetylene (See Cutting Apparatus)
Towers and Transmission Structures
Archbold-Brady Co.
Westinghouse E. & M. Co.
Track Grinders
Railway Track-work Co.
Trackless Trolley Cars
Brill Co., J. G., The
St. Louis Car Co.
Track, Special Work
Barbour-Stockwell Co.
Bethlehem Steel Co.
Ramapo Ajax Corp.
Transfer (See Tickets)
Transfer Issuing Machines
Ohmer Fare Register Co.
Transfer Tables
American Bridge Co.
Transformers
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.
Treads, Safety, Stair, Car Step
Morton Mfg. Co.
Trolley Bases
Elec. Service Supplies Co.
General Electric Co.
More-Jones Brass & Metal Co.
Nuttall Co., R. D.
Ohio Brass Co.
Trolley Bases, Retrieving
Elec. Service Supplies Co.
Nuttall Co., R. D.
Ohio Brass Co.
Trolley Buses
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.
Trolley Material, Overhead
Anderson, A. & J. M. Mfg. Co.
Elec. Service Supplies Co.
More-Jones Brass & Metal Co.
Ohio Brass Co.
Trolley Wheel Bushings
More-Jones Brass & Metal Co.
Trolley Wheels & Harps
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Thornton Trolley Wheel Co.
Trolley Wheels (See Wheels, Trolley)
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Amer. Electrical Works
Amer. Steel & Wire Co.
Anaconda Copper Min. Co.
Roebling's Sons Co., J. A.
Trucks, Car
Bemis Car Truck Co.
Brill Co., The J. G.
McGuire-Cummings Mfg. Co.
St. Louis Car Co.
Taylor Elec. Truck Co.
Tubing, Yellow & Black Flexible Varnish
Irvington Varnish & Ins. Co.
Turbines, Steam
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.
Turbines, Water
Allis-Chalmers Mfg. Co.
Turnstiles
Elec. Service Supplies Co.
Perey Mfg. Co., Inc.
Valves
Ohio Brass Co.
Westinghouse Tr. Br. Co.
Varnished Papers & Silks
Acme Wire Co.
Irvington Varnish & Ins. Co.
Ventilators, Car
Brill Co., The J. G.
Nat'l Ry. Appliance Co.
Nichols-Lintern Co.
Railway Utility Co.
St. Louis Car Co.
Welded Rail Joints
Alumino-Thermic Corp.
Ohio Brass Co.
Railway Track-work Co.
Rail Welding & Bonding Co.
Welders, Portable Electric
Ohio Brass Co.
Railway Track-work Co.
Rail Welding & Bonding Co.
Welding & Cutting Tools
International Oxygen Co.
Welding Processes and Apparatus
Alumino-Thermic Corp.
General Electric Co.
International Oxygen Co.
Ohio Brass Co.
Railway Track-work Co.
Rail Welding & Bonding Co.
Westinghouse E. & M. Co.
Welding Steel
Railway Track-work Co.
Rail Welding & Bonding Co.
Wheel Guards (See Fenders and Wheel Guards)
Wheel Presses (See Machine Tools)
Wheels, Car, Cast Iron
Bemis Car Truck Co.
Carnegie Steel Co.
Griffin Wheel Co.
Wheels, Wrought Steel
Carnegie Steel Co.
Wheels, Trolley
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
More-Jones Brass & Metal Co.
Nuttall Co., R. D.
Star Brass Works.
Whistles, Air
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
Wire Rope
Roebling's Sons Co., J. A.
Wires and Cables
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Okonite Co.
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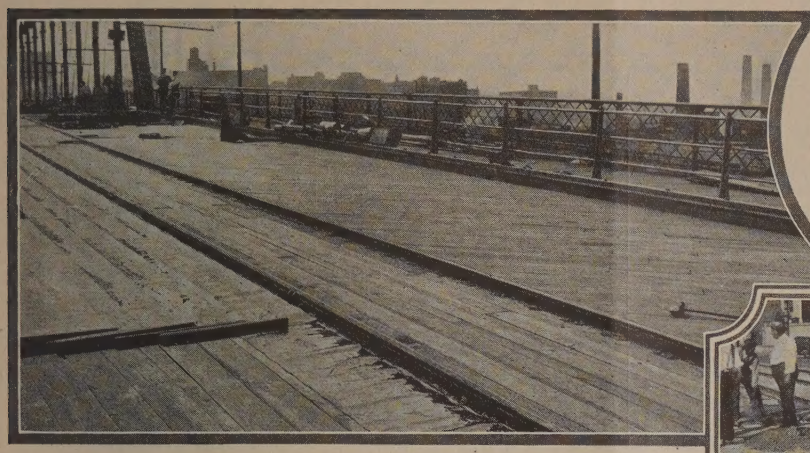
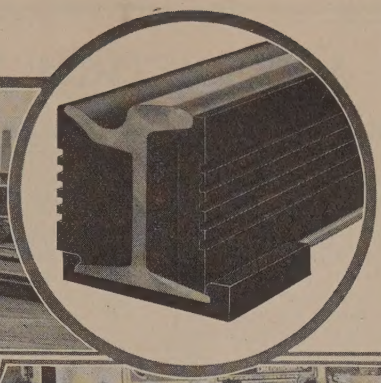


Omaha and Council Bluffs Street Railway Bridge, Omaha, Neb.



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Make the track as watertight as the bridge-deck!

Engineers take every precaution to waterproof bridges and viaducts, yet there has always been a vulnerable point between the track and the bridge paving through which water and frost might enter, resulting in the weakening of the structure and concrete staining.

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53 Wayne Ave., Lockland, Cincinnati, Ohio

Elastite Rail Filler

is easy to install. A tap of a mallet sets it in the web of the rail. Carey Elastite Rail Filler is a composition of specially-tempered asphalt and fibre which is used as a resilient cushion between the rail and the pavement, absorbing traffic-impact, rail-vibration, and traffic-noise. It is preformed to fit any rail-section and is readily shaped on the job to fit any track-curve. It is unaffected by moisture or temperature changes and is enduring under all service conditions.

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RAIL FILLER

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FORGED STEEL AXLES
For Locomotives, Passenger, Freight and Electric Cars
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We guarantee
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Trenton & Mercer Co. Trac. Corp.

New City and Suburban Cars

Twenty light-weight, one-man two-man cars of this type were recently built in our Philadelphia Plant for Trenton, N. J. Ten cars include quadruple 25 Hp. motor equipment for city service, and ten are equipped with quadruple 35 Hp. motors for suburban service. Otherwise, the cars are practically identical, being mounted on Brill 77-E low-level trucks equipped with Brill Twin Swing Links, measure 44 ft. long over platforms, and seat 48 passengers.

The city cars weigh 34,476 lb. and the suburban cars 36,746 lb.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

AURORA, ELGIN AND FOX RIVER ELECTRIC COMPANY
AURORA, ILLINOIS

September 4, 1924.

MR. A.P. JENKS,
Railway Department,
General Electric Co.,
Illinois Merchants Bank Bldg.,
Chicago, Illinois.

Dear Mr. Jenks:-

Noticing your adv. on the back cover of the Electric Railway Journal, August 30th issue, where your company very graciously used photographs of our cars, I thought perhaps it would be interesting for you to know that we have now had our city cars, which are equipped with the GE-264 motors, in operation one year, each car averaging approximately 4200 miles per month. Our interurbans with the GE-265 motors have only been in operation approximately nine months, averaging 5000 miles per month. Now that our summer business is nearly over, we are taking down all motors, making a complete and thorough inspection, cleaning all parts. I am certain it will be interesting to your company to know that we have not as yet had one failure in any of the GE-264 motors and only one failure in the GE-265 motors, this being occasioned by the motorman's mis-use when stuck in a snow drift with one pair of trucks off track last February.

To me this is a wonderful record, where equipment on forty-seven cars has stood up as this equipment has and not suffered one failure of any description. If this information is of any value to you, you may use these figures to whatever extent you may desire.

With kindest personal regards,

I beg to remain,

Yours very truly,

GENERAL MANAGER,

On the Aurora, Elgin & Fox River
1923
Light-Weight
City Cars
Showed
the way to
Light-Weight Interurbans
1924
"And both the company and the public are pleased with the cars and with the service they are giving."
A familiar testimony of satisfaction realized from G-E Car Equipment constantly selected for modern light-weight cars.
In this case, the city cars are equipped with GE-264 Motors and K Control; the new interurban cars with GE-265 Motors and K Control.
GENERAL ELECTRIC

More Modernization Results

G-E modern equipment on this middle-west road is living up to the high standard it has set on many other progressive properties.

General Electric Company
Schenectady, N. Y.

11-1

GENERAL ELECTRIC